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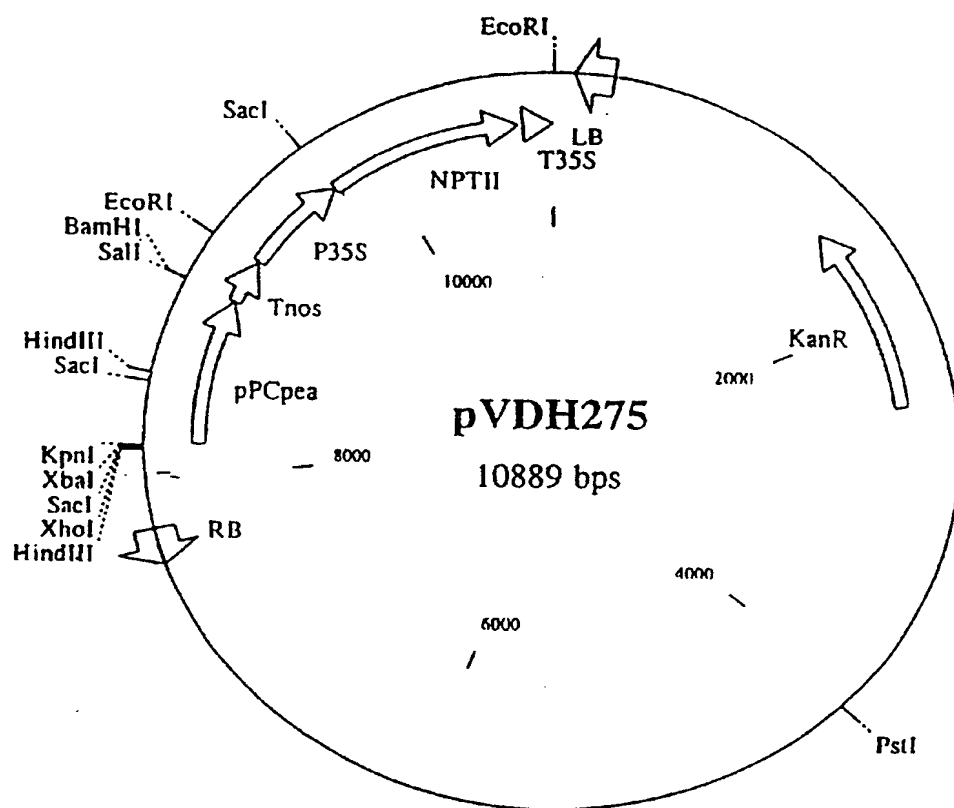


Fig. 1

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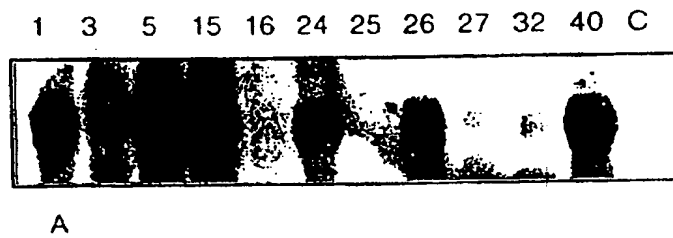


Fig. 2

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LINEUP of: TPSPLANT from: 1 to: 595 April 19, 1996 14:01 ..

	1	50
Tpsyest	MTTDNAKAQL TSSSGGNIIV VSNRLPVTIT KNSSTGQY EY AMSSGGLVTA	
	51	100
Tpsyest	LEGLKKTYTF KWFGWPGLEI PDDEKDQVRK DLLEKFNAVP IFLSDEIADL	
	101	150
Tpsssel8		
Tpsyest	HYNGFSNSIL WPLFHYHPGE INFDENAWLA YNEANQTFTN EIAKTMNHND	
	151	200
Tpsrice2		YRSLPVR
Tpssun10		GWFLHTPFPS SEVYKTLPMR
Tpsssel43		GWFLHTPFPS SEIYRTLPLR
Tpsssel8	IMWVHDYHLC LVPQMIROKL PDVQI.....	GFFLHTAFPS SEVFRCLAAR
Tpsyest	LIWVHDYHLM LVPEMLRVKI HEKQLQNVKV	GWFLHTPFPS SEIYRILPVR
	201	250
Tpsrice2	DEILKSLINC DLIGFHTFDY ARHFLSCCSR MLGIEYQSKR	GYIGLDYFGR
Tpssun10	NELLKGLLNA DLIGFHTYDY ARHFLTCCSR MFGLDHQLKR	GYIFLEYNGR
Tpsssel43	AELLOQVLGA DLVGFHTYDY ARHFVS....	..AMHTDTRA GRHSQGVEDQ
Tpsssel8	KELLDGMLGA NLVAFQTPEY AHHFLQ....	..XVQSHXSL LKQRP.....
Tpsyest	QEILKGVLSL DLVGFHTYDY ARHFLSSVQR	VLNVNTLPNG VEYQGRFVNV
	251	300
Tpsrice2	TVGIKIMPGV INMTQLQTQI RLPDLEWRVA NSGSSLMGRL	SCSVWMIWTY
Ricetps		EWRV SELQQQFEGK .....TVL ....LGVDMM
Tpssun10	SIEIKIKASG IHVGRMESYL SQPDTRLQVQ EVK..KEIVL	....LGVDLL
Tpsssel43	GKITRVAA.. FPVDRFGAIY RRVETDAVKK HMQELSQVLL	S*GYVGVDRL
Tpsssel8	.....KA.. FS.XRFVNVW ...SX..MQE ALRXVKKVIV	ARDKLTTSR.
Tpsyest	GAPFIGIDVD KFTDGLKES VQKRIQQLKE TFKGCKIIV.	.....GVDRL
	301	350
Tpsatal3		.G
Tpsatal56		N EELRGKVVLV QITNPARSS. ....G
Tpsrice2	LR..GLI*KF LRFEQMLRTH PKWQPRQFWC RFKPRVVVGR	TLXYSXDXV
Ricetps	DIFKGINLKL LAFENMLRTH PKWQGRAVLV QIANPARGK.	.....G
Tpssun10	DIFKGVNFKV LALEKLLKSH PSWQGRVVLV QILNPSR.R.	.....C
Tpsssel43	DMIKGIPQKL LAFEFLEEN SEWRDKVVLV QIAVPTRTD.	.....V
Tpsssel8	.....VREKL LSYELFLNKN PQWRDKVVLV QVATSTEDS	ELAATXYPKL
Tpsyest	DYIKGVPQKL HAMEVFLNEH PEWRGKVVLV QVAVPSRGDV	EEYQYLRVSV

Fig. 3A

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	351		400
Tpsatal3	IDVEEIRGEI	EESCRRING. EFGKXGYQPI	IYIDXPVSIN EINAYXHIAE
Tpsatal56	KDVQDVEKQI	NXIADDEINSK FGRPGGYKPI	VFVNGPVSTL DKVAYYAISE
Tpsrice2	QXVMTFQAGI	SL	
Ricetps	KDLEAIQAEI	HESCKRING. EFGQSGYSPV	VFIDRDVSSV EEDCLLHNSR
Tpssun10	QDVDEINAEI	RTVCERINN. ELGSPGYQPV	VLIDGPVSLS EKAAYYVIAD
Tpssel43	LEYQKLTSQV	HEIVGRING. RFGSLTAVPI	HHLDRSMKFP ELCALYAITD
Tpssel18	LHVLTLCTRR	SHTPTRLPQ. ARHCVLAVPR	TSLDRRCSCN QLF.....
Tpsyeast	NELVG.....	.....RING. QFGTVEFVPI	HFMHKSIPFE ELISLYAVSD
	401		450
Tpsatal3	CVVVTAVRDG	MNLTPYEYIV CRQGLLGSES	DFSGPKKSMML ....VASXFI
Tpsatal56	CVVVNXVRDG	MNLVPYKYTV TRQGSPALDA	ALGFGEEDVR KSVIIVSEFI
Tpsatal142			AVVDSSPR TSTLVVSEFI
Tpsrice3			GP K KSMMLVVSEFI
Ricetps	MCGGDCC*GW	D*LDTIWIYC L*GRGLTXHQ	R
Tpssun10	MAIVTPLRDG	MNLV	
Tpssel43	VLLVTSLRDG	MNFV	
Tpssel18	.....DG	MNLV	
Tpsyeast	VCLVSSTRDG	MNLVSYEYIA CQEE.....	.....K KGSLILSEFT
	451		500
Tpsatal3	WMXPFFRLXGA	IRVNPW	
Tpsatal56	GCXP.SLSGA	IXVNPWNIXA V	
Tpsatal142	GCSP.SLSGA	IRVNPWDVDA VAEAVNSALK	MSETEKQLRH EKHYHYISTH
Tpsrice3	GCSP.SLSGA	IRVNPWNIEA TAEALNEAIS	MSERXKQLRH EKHYRYVSTH
Tpsyeast	GAAQ.SLNGA	IIVNPWNTDD LSDAINEALT	LPDVKKEVNW EKLYKYISKY
	501		550
Tpsatal142	DVGTWAKSFM	QDLERACRDH YSKRCWGIGF	GLGFRVLSLSP SFRKLS
Tpsrice3	DVAYWSKSFV	QDLERACKDH FRKPCWGIGX	GFRXR
Tpsyeast	TSAFWGENFV	HELYSTSSSS TSSSATKN**	TRCK*DDRLE LVRFSLSLL
	551		595
Tpsyeast	FTFFILYIKL	YK*HN*NATR PLLFVNACL*	RC*LKLRLK*F FHRIG

Fig. 3B

84 85 88 87

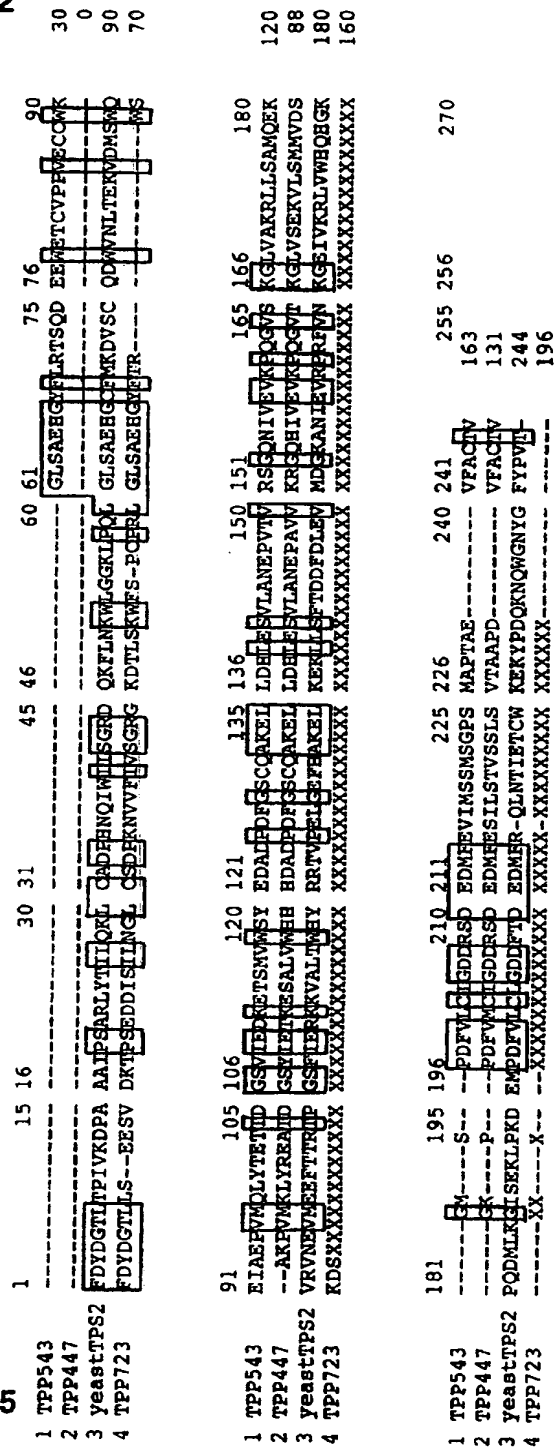
**Fig. 4**

	1	15	16	30	31	45	46	60	61	75	76	90
1	---	CHIDPRNC	-SE	RVMZLCVVKQF	--EG	KTVLLGADMDIIFKQ	MNIKILAMEQMINIT	PSGKRGCLCWSKIANE	TRGKGVDFDEIQAEI			
1	TPS840											
2	TPS630											
2		IIMGFSFNLDLP	-ET	EAKVFGTRQQNEHQ		RTLLIGVMDWLLFKG	ISILKILAMEQIILQH	PEKQKGVVLVQIYANE	ARGKGDVKEVQOET			
3	TPS825											
3		IIMGQIQNVMSLMDT	GKKAKELKEKY	--EG	KIVMLGUDMDIMFKG	IGLKFTIANGRIIDEN	EWLRGKVVIVVXXKXW	XXXXXXXXXXXXXXXXXX				
4	yeastTPS1											
4		-DVDFRTDGLKKEV	QKRIOQLKETY	--RG	CKIIVGVMDRIIDYIKG	VPQGLAMEVITLNEH	PEWRGKVVVLVQVYAF	SRGQVEEYQYILRSV				
91		105	106	120	121	135	136	150	151	165	166	180
1	TPS840											
1		SESCRIRIKQF	GRPG	YETIVVIDRPPVSSSE	RMAYNFIAGVCVVVTA	VSQGNILF						
2	TPS630											
2		SLTWKRIINEAF	GRPG	YETVILLIDKPLKFFE	RIAYNFIAGVCVVVTA	VSQGNILF						
3	TPS825											
3		XXXXXKIRIKKYGKPG	YETIVVICINGPVSTQD	KIABMAVIECVVVNA	VRQGNH							
4	yeastTPS1											
4		NELTVGRINGQFNEVE	FVEIHPNFKSIPFEE	LISIMAVSDVCLVSS	TROGNILV							

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# Alignment tobacco TPP genes with yeast TPS2

Fig. 5



1	15	16	30	31	45	46	60	61	75	76	90
1	bipsunfl	---	---	---	---	---	---	---	---	---	---
2	yeastps2	WTTAQDNPSPKRR	IINCVTQLPYKIQLG	ESNDWKISATGNS	ALYSSLEYLQDSTE	YECHEVGTWCEITAT	ERNLFTREAKEFDD	---	---	---	---
91	105	106	120	121	135	136	150	151	165	166	180
1	bipsunfl	---	VSMTLIRFN	---	--CVAFFVRS	---	---	---	---	---	---
2	yeastps2	IDDPLYLTKEQING	LTTTIDEMKSDEKA	KTDTTQTATVNTNVH	PVLLLNQSRWNY	AEKVWETFEHLNP	SNEGEQ--EKNQWVD	---	---	---	---
181	195	196	210	211	225	226	240	241	255	256	270
1	bipsunfl	YVWVKEFSQVME	VYNASNVYIHDYH	MTLPHLIRFRCR	---	FMIGFHEHPSSE	VYKTHFARNELIKEL	LMDIUIHETTYDYAR	---	---	---
2	yeastps2	YVWVKEAYABXGEV	YRKG-DIIMHBYH	LILFOLLIRKXNDSE	IILGHEHFNPSNE	---	YFRCLFRRKQIULDE	VGNRULFONESTSR	---	---	---
271	285	286	300	301	315	316	330	331	345	346	360
1	bipsunfl	HELTCCSIFGLDHO	LKRG	---	WIFLE	FNRSLEIKIKASLI	HVGKMSYLSQDTR	LQVDELRKFEGRIV	LIGVDDLPFGVNF	---	---
2	yeastps2	HEVSSCKELLDATAK	KERNSSDSQYQVSV	YGG-DYLVDSLPICV	NTTQILKDAFTDID	SKVLSIQAYQNKKI	IILGHEHFNPSNE	---	---	---	---
361	375	376	390	391	405	406	420	421	435	436	450
1	bipsunfl	QVIRUKELIKSEHGM	QGRVIVQILNPARA	R-CQVDEINAEIRT	VCSRINNNEISPGYQ	---	PVWLIDGPVLSSEKA	AYYAIRDMAIVPTLR	---	---	---
2	yeastps2	QVIRUKELIKSEHGM	RDQVIVQVSSHPAN	QNSPQIRLEQOVNE	LVNSLNSSEHNLNFS	---	PVCHYYNMRIPKDVYL	SLLRVADCLITJSVR	---	---	---
451	465	466	480	481	495	496	510	511	525	526	540
1	bipsunfl	DGMNLAIPYEVVSQR	SVNDPNPNTPKKSM	VYSEERIGLSLTGA	IRUNPWDELETAAL	YQALMAPDDHKETAH	MKQYQVLIISHDVANR	---	---	---	---
2	yeastps2	DGMNMTALEYTVXS	HMSN---	FLCYGNHPL	ILSEFGSSNVLKDA	IVNPNWDSVAVAKSI	NHAKLDKEEKNLE	SKLWKEVP--TIQDA	---	---	---
541	555	556	570	571	585	586	600	601	615	616	630
1	bipsunfl	ARSFQDQOACIDB	SKRCNMILFGLDTR	VVLDFEKTSMIDIV	LENAYSMADNRAL	---	DYDGTWTFPSISK---	--SPTEAVISMINKLO	---	---	---
2	yeastps2	TNNELSLKEKASD	DD---	VERKMTPALRRVR	ILENYKQKTHLPLF	---	DYDGTTHFELVKUPAA	ALISARLYTILKLO	---	---	---
631	645	646	660	661	675	676	690	691	705	706	720
1	bipsunfl	NDRKNVTPVSGGR	ENIGSMGACEKPA	IAREHGLIRWAGQ	ZNETCATRENNVGMTE	MAEFANLVEITDNG	SMTEKRETAWVHVE	---	---	---	---
2	yeastps2	ADPHNQIMUISGRDQ	KELNMYLCEKLPOLG	LSAEHGLFMKDVSQ	DAVNLTKEVDMSQV	RVNEMVEEFTIRFEG	SETEKREKVALTPHYR	---	---	---	---
721	735	736	750	751	765	766	780	781	795	796	810
1	bipsunfl	DADKDLGLEOKELL	DEEENVLANEPVNR	RDYIVVEKQVOPHX	LPSCYDIHERAFVES	FNLANFFKPCNYRGS	XRGIMAEKIFAPMAE	---	---	---	---
2	yeastps2	RTVPELGEFHAKEIK	EKLISFTDDDFDLEW	DGRANIEVERFVNR	GEIVKRLVMEDEGKP	QDMLKGISSEKLPKDE	HPDFMLCLGDDHDE	---	---	---	---
811	825	826	840	841	855	856	870	871	885	886	900
1	bipsunfl	-KGRADFLVSGDD	RS-DED	---	H	FVAIPDGKTR	---	SVTCV	VGEK---	PSAEYELD	---
2	yeastps2	DMFROINTIETCWKE	KYDPKKNONGNYGFY	PAUVSASAKIVAKA	HIDPPQVLEITLGLL	VGVDSILFQSACTVIL	DSRGHVKNSSSLMS	---	---	---	---
901	915	916	930	931	945	946	960	961	975	976	990
1	bipsunfl	MMLEELGCLSNQD	---	---	---	---	---	---	---	---	---
2	yeastps2	KLASFAYVWKRCSAY	TGAKV	779	896	---	---	---	---	---	---

**Fig. 6**



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# Alignment plant TPS genes with yeast TPS1

	1	15	16	30	31	45	46	60	61	75	76	90
1	TPS1arab	KQEMKELKEKFTDRK	VNLGVDRUDMIKGP	CGLLIAPEKFF	EEENAN	RRDKVWILAKIAHHR	PDVPEYQTLTSQVHE	IVGRINIGRUGLTAV	90			
2	TPS1yeast	--RIQQLKSTKGGCK	LIIVGVDRUDMIKGP	CKLEADEVFLNEHPE	RRGRKVTIQQVAVESR	GDVEEYQYLRSVVNS	LVGRINIGRUGLTAV	88				
3	ESTrice	EWKVSSELOQPFEGKT	VLLGVDDVDFIKGLN	IAALLAENMIAETHPK	MOGRATLVQIAHHR	GKGRDLAIAQAEIHE	SCRRTNCEFEESGYS	90				
		105	106	120	121	135	136	150	151	165	166	180
1	TPS1arab	PLIHHLDRSLDFEALC	ALYAVIDVAVLMSLR	DGMNLV	126							
2	TPS1yeast	PLIEFMKRSIPFEELI	SLYAVSDVCLVSSIR	DGMNLI	123							
3	ESTrice	EVVFIDRDVSSVEED	CL		107							

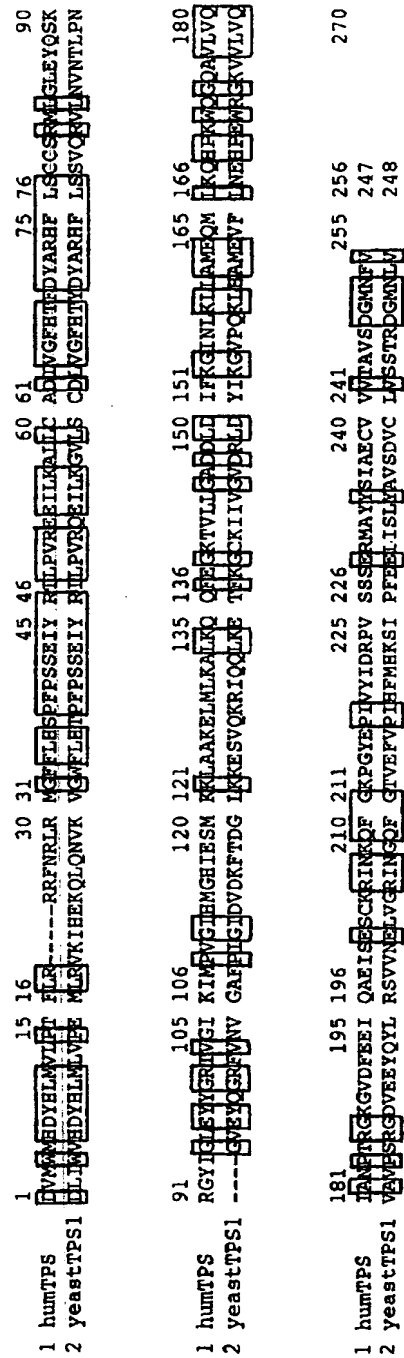
Fig. 7

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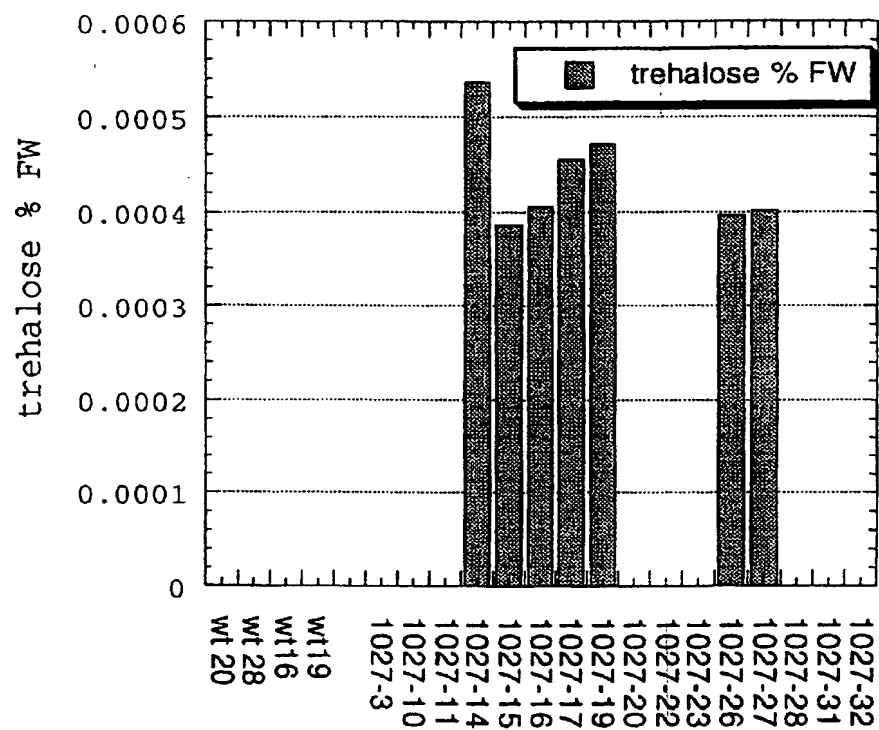
85  
9017  
17

# Alignment human TPS gene with yeast TPS1

Fig. 8



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**S. tuberosum pMOG1027****Fig. 9**

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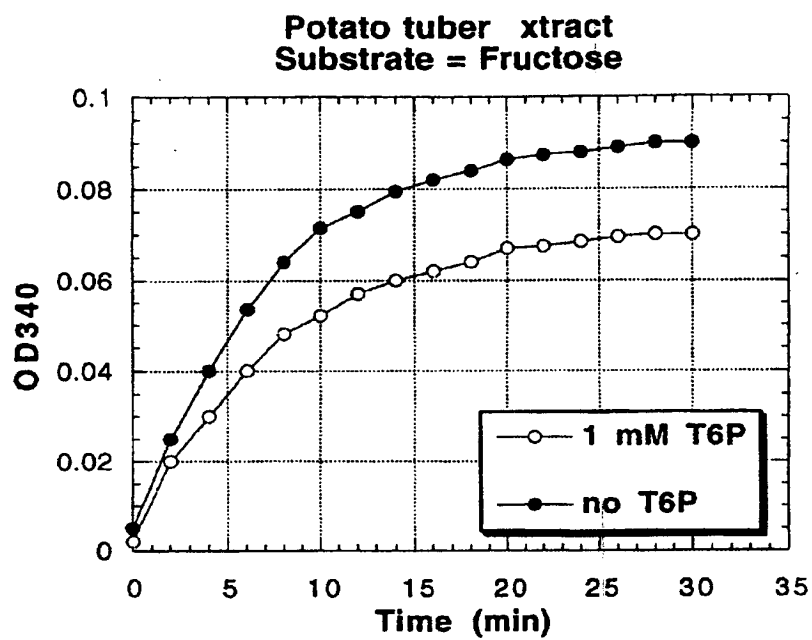
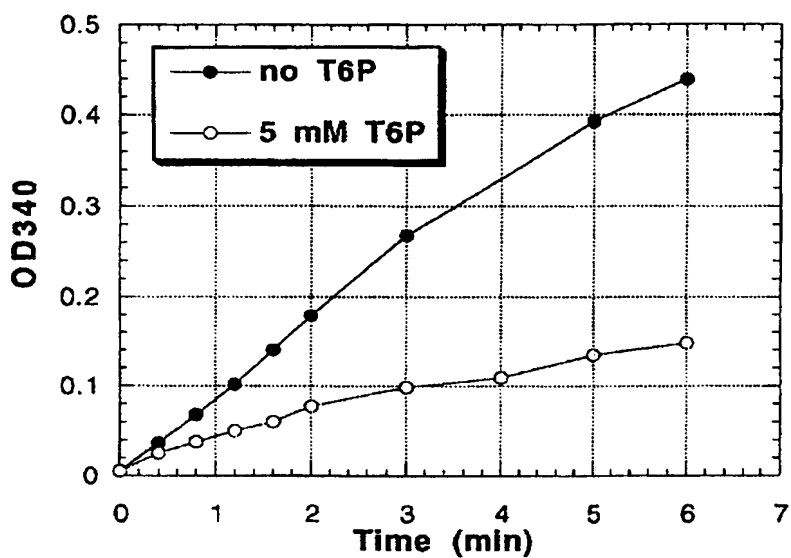


Fig. 10

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**Potato tuber extract**  
**Substrate = Fructose**



**Potato tuber extract**  
**Substrate = Glucose**

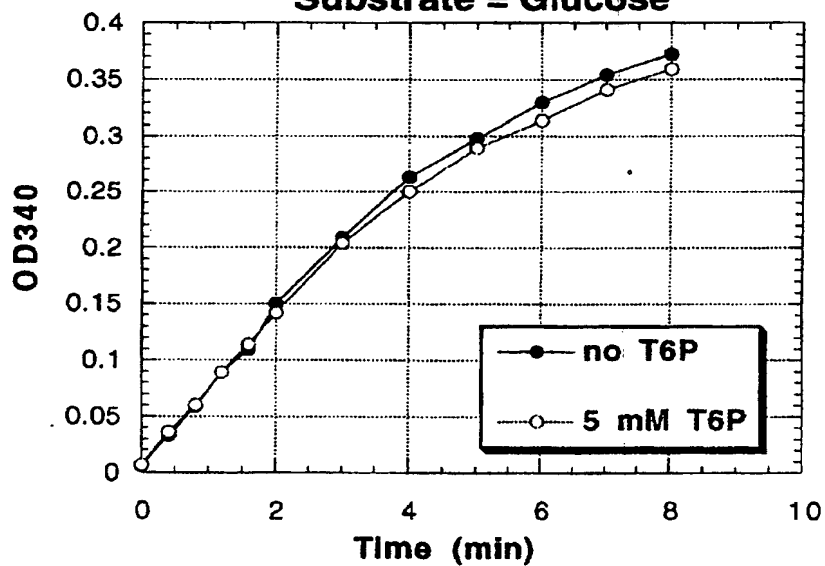


Fig. 11

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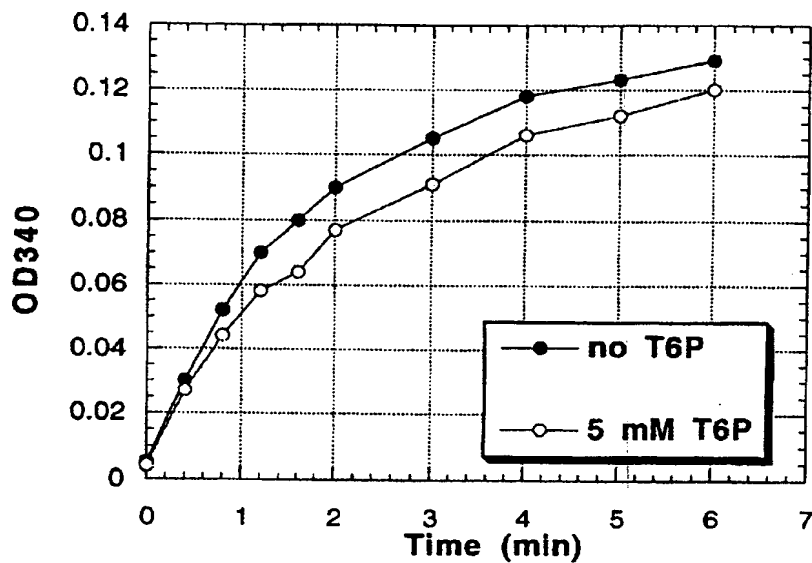
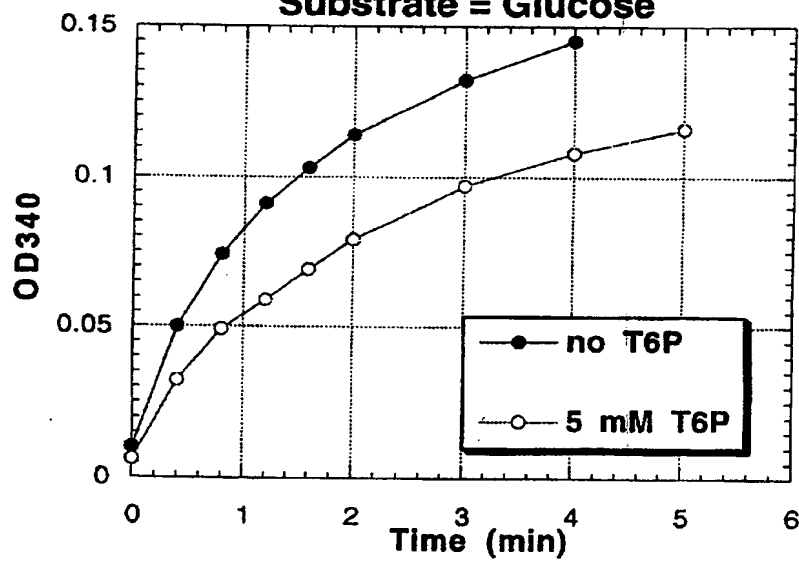
**Tobacco leaf extract  
Substrate = Fructose****Tobacco leaf extract  
Substrate = Glucose**

Fig. 12

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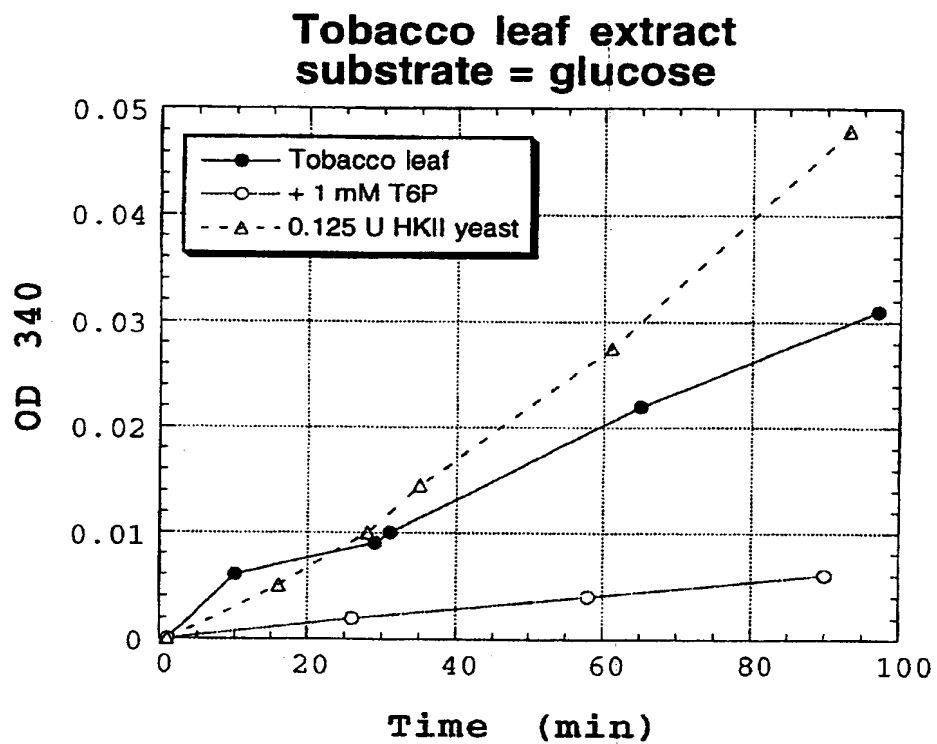
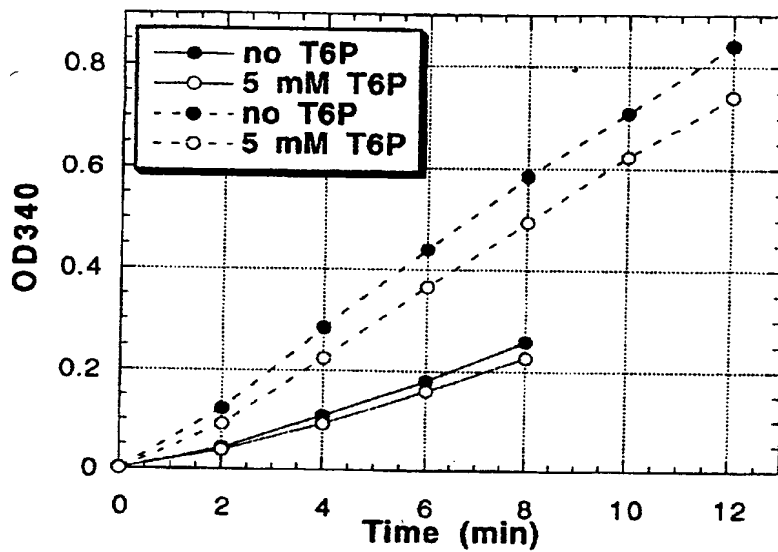


Fig. 13

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**Ric leaf extract**  
**Substrate = Fructose**



**Rice leaf extract**  
**Substrate = Glucose**

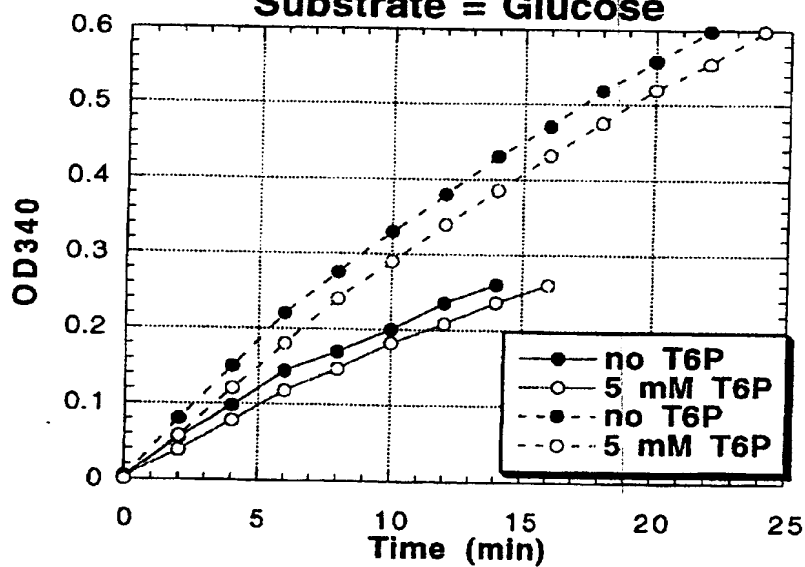
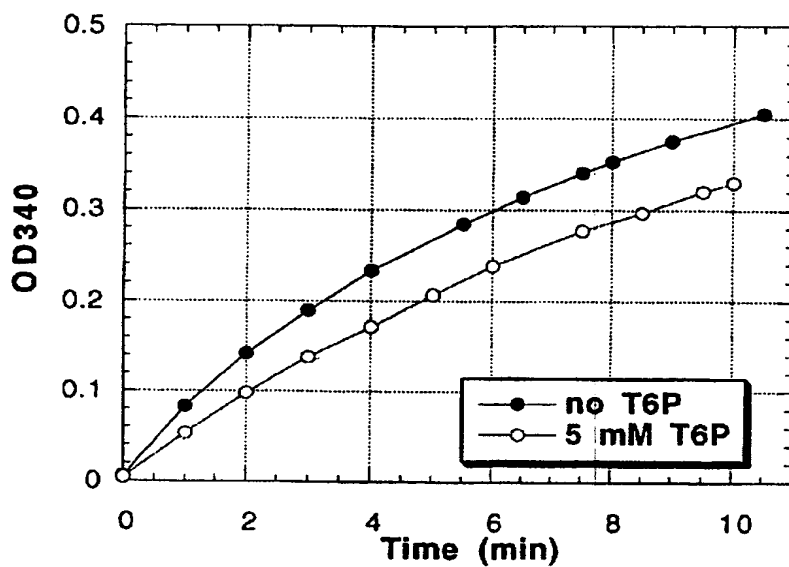


Fig. 14



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**Maize leaf extract**  
**Substrate = Fructose**



**Maize leaf extract**  
**Substrate = Glucose**

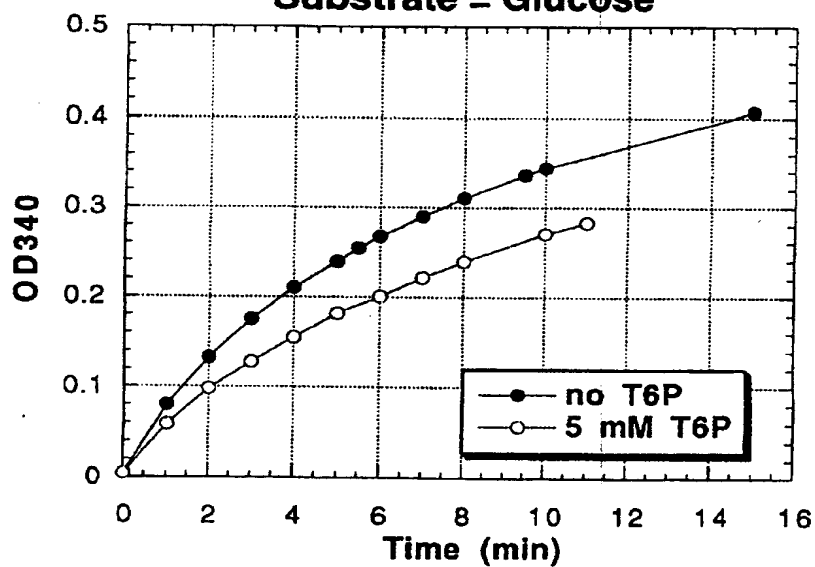


Fig. 15

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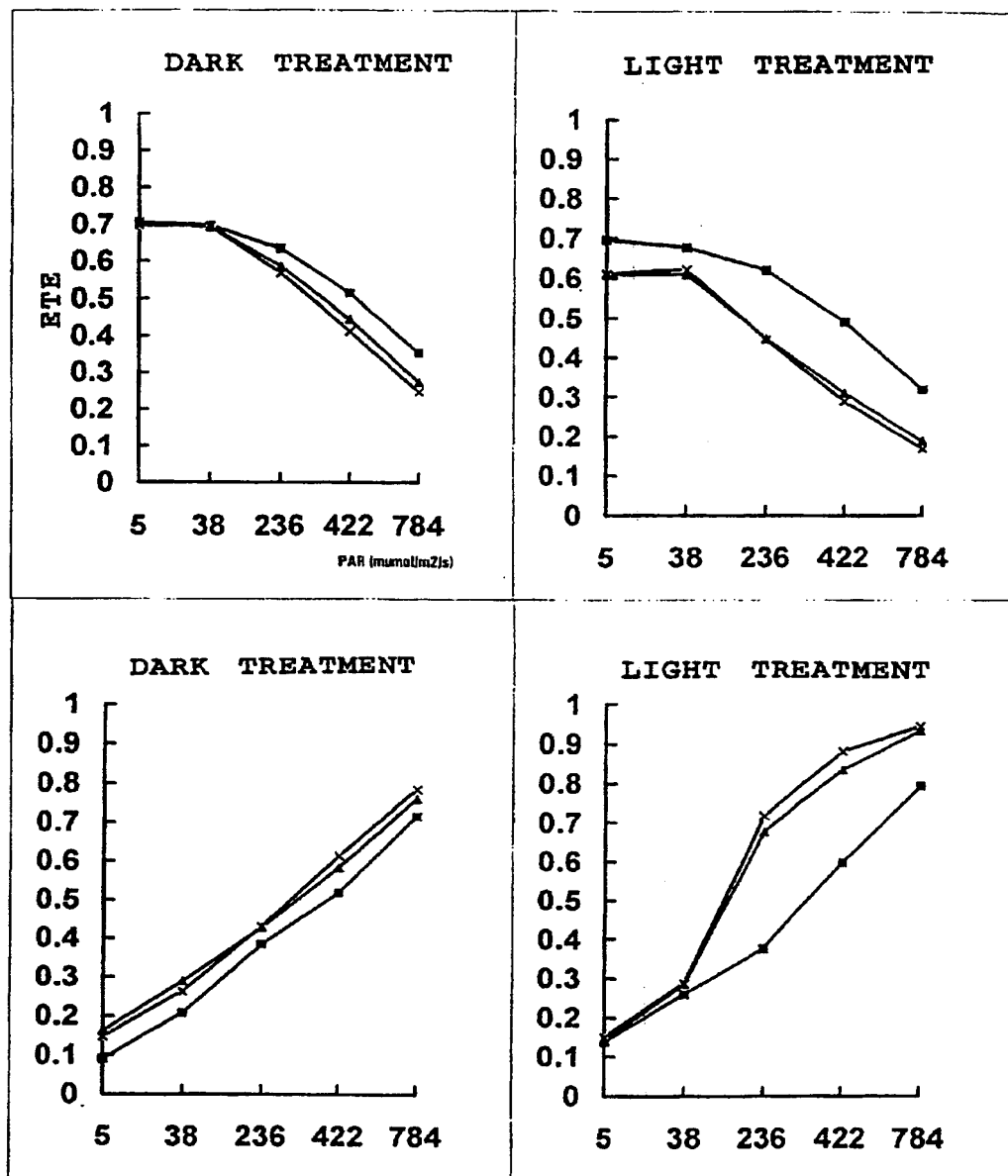


Fig. 16

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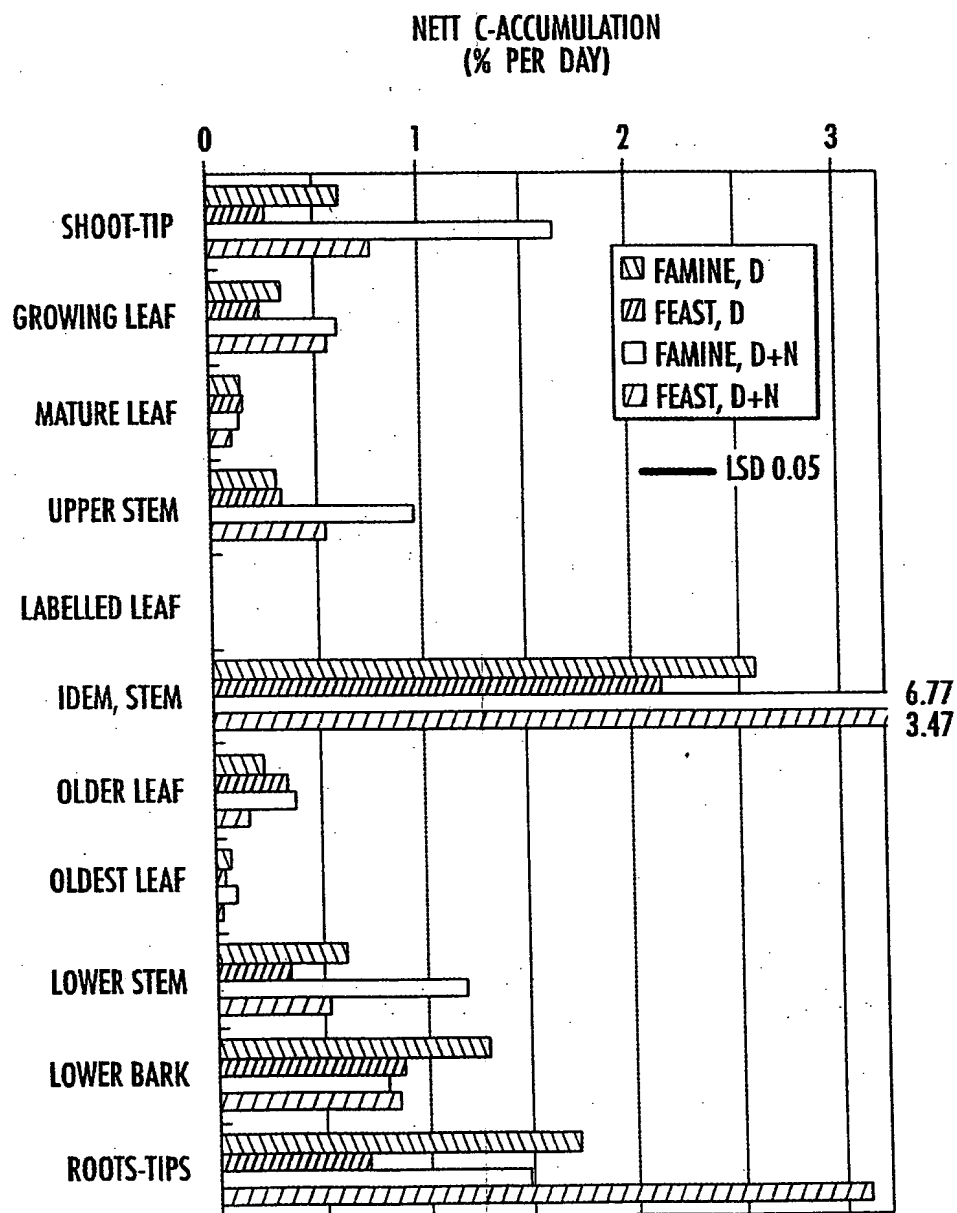


Fig. 17

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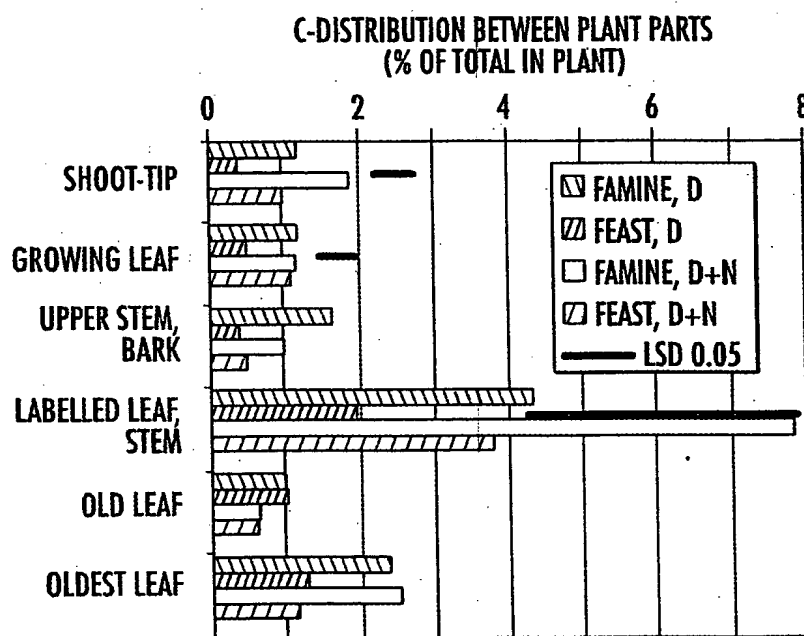
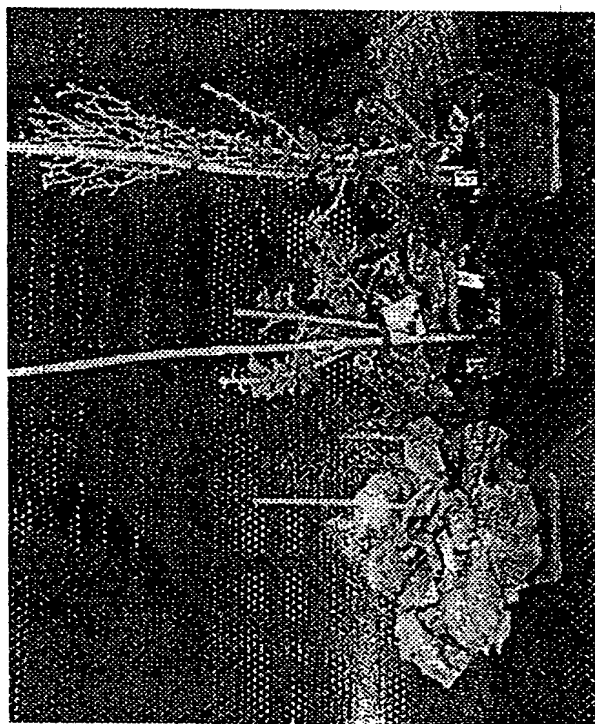


Fig. 18

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Fig. 19



TPS

CONTROL

TPP



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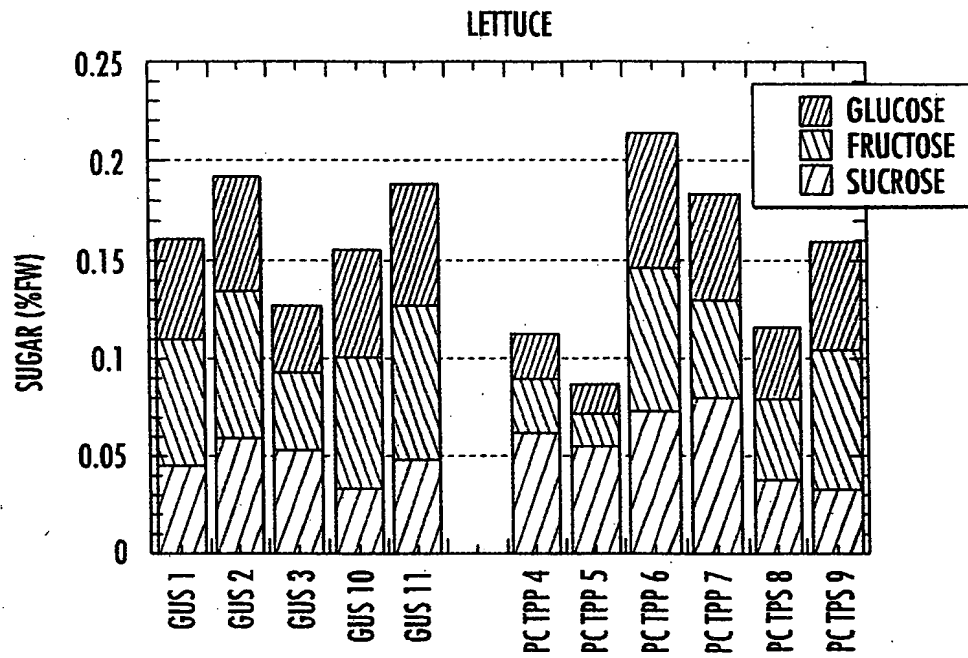


Fig. 20A

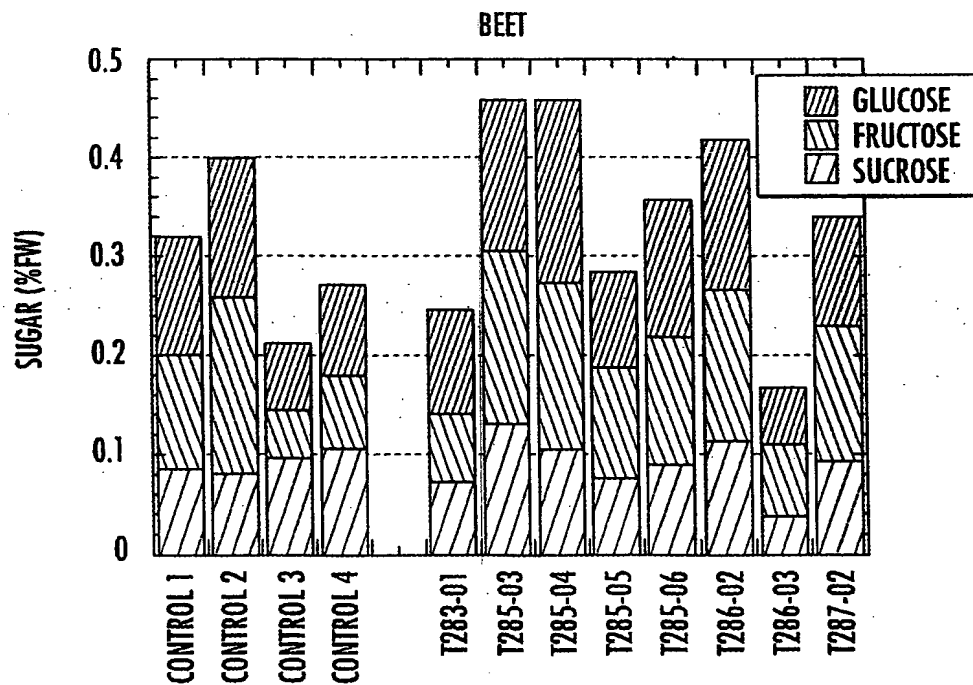


Fig. 20B

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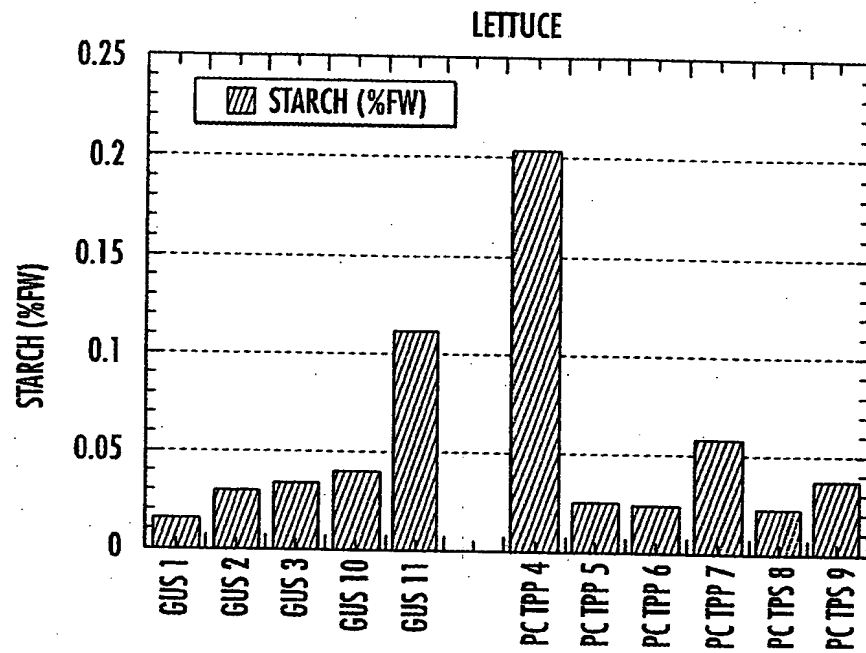


Fig. 20C

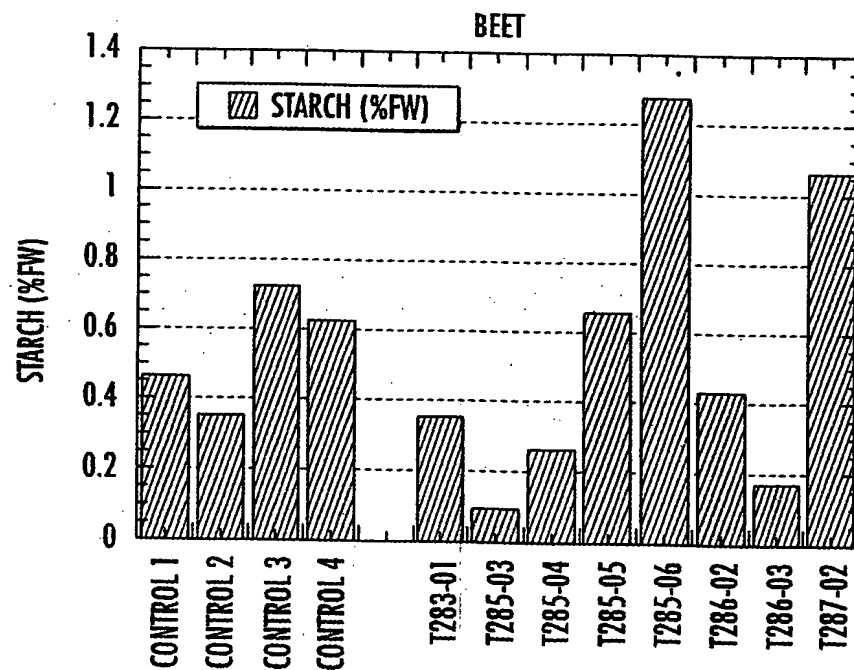


Fig. 20D

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CONTROL

TPP

TPS  
(A-TYPE)

TPS  
(D-TYPE)

Fig. 21



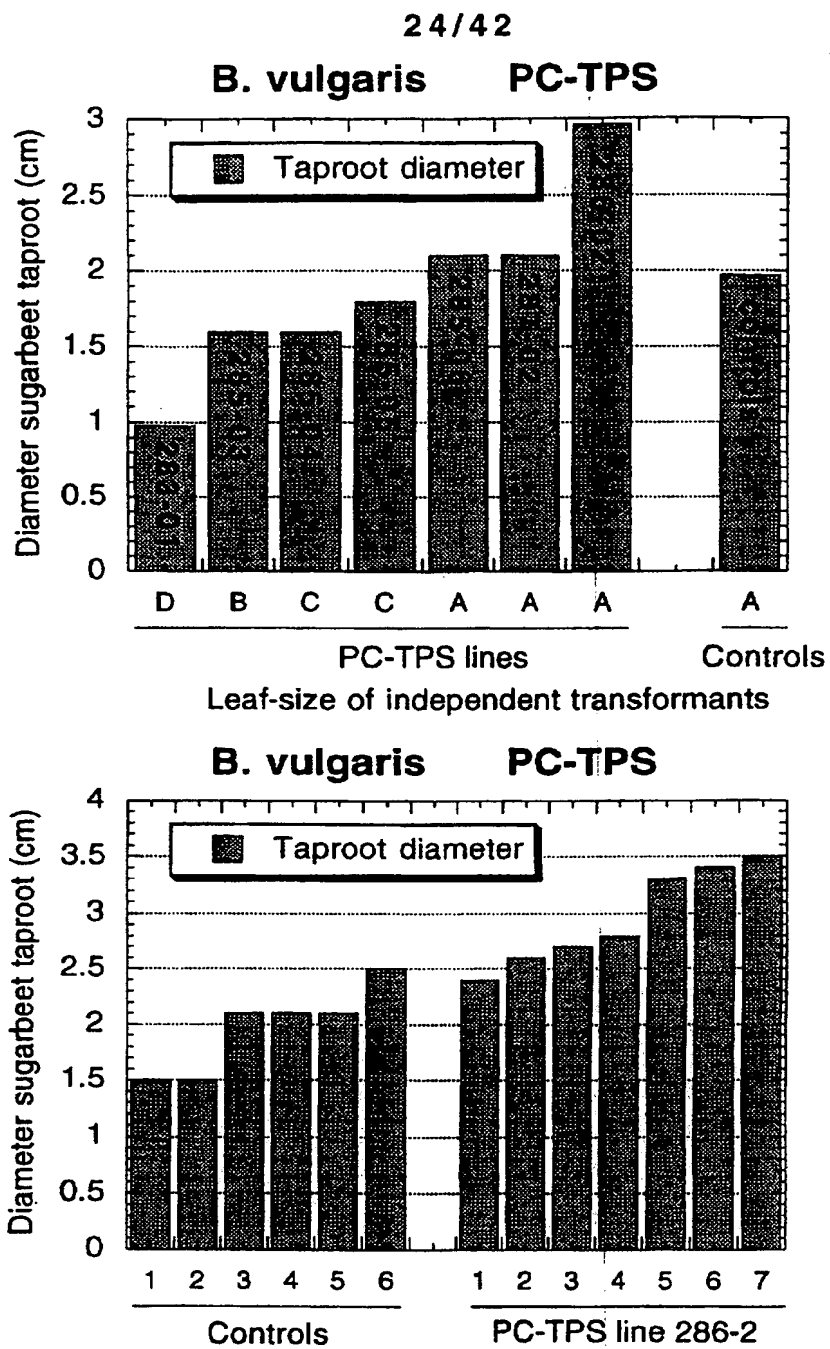


Fig. 22

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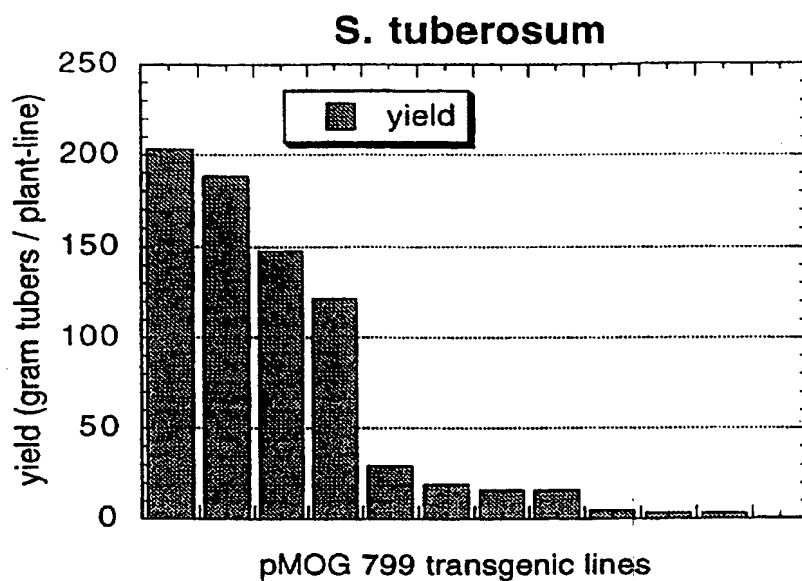


Fig. 23

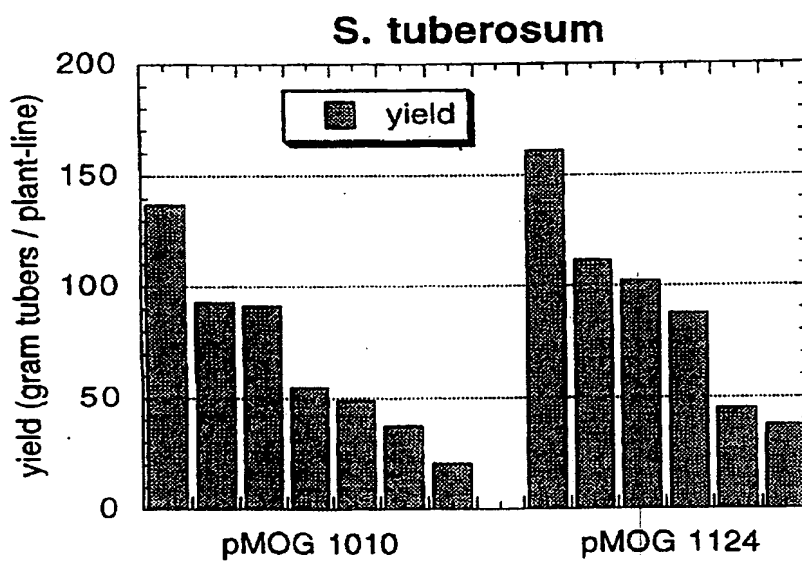


Fig. 24

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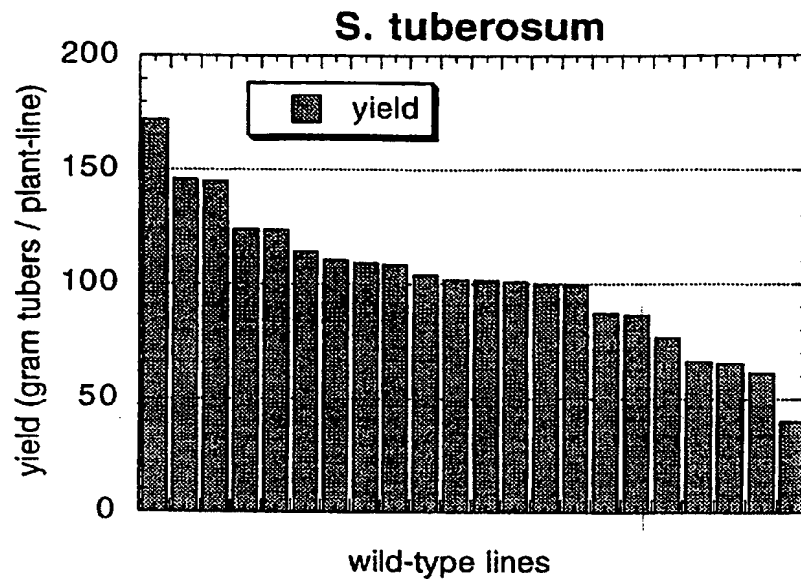


Fig. 25

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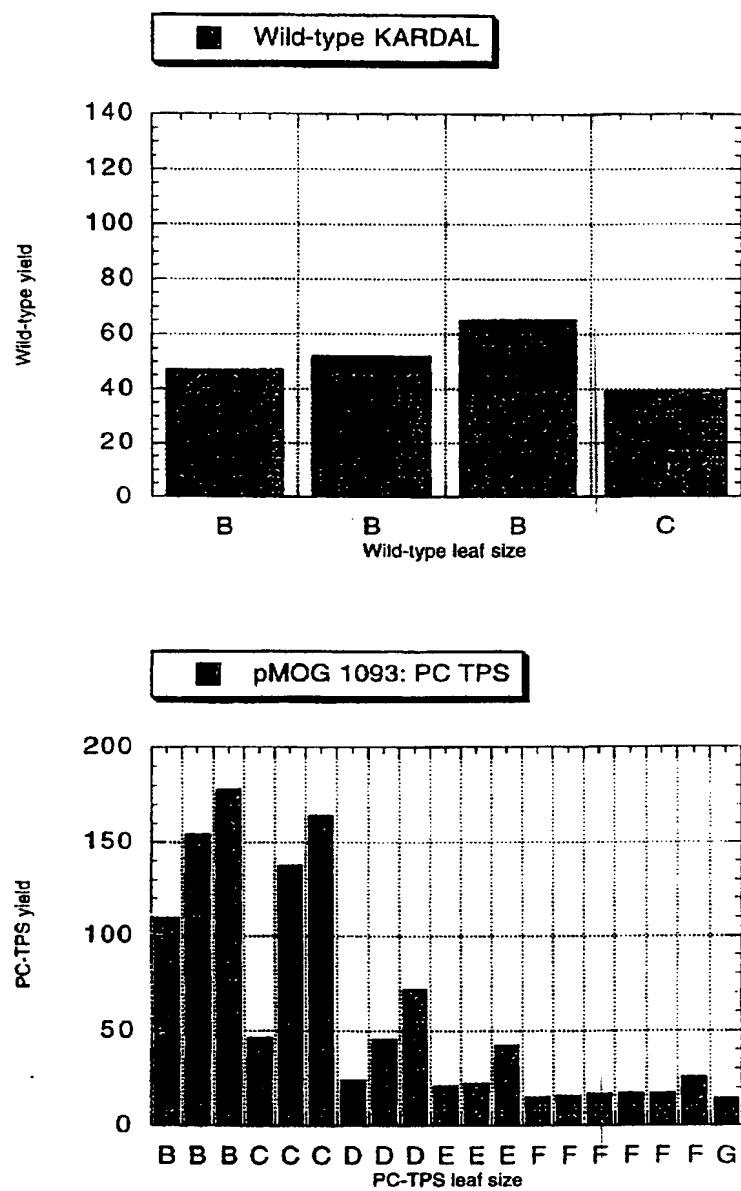
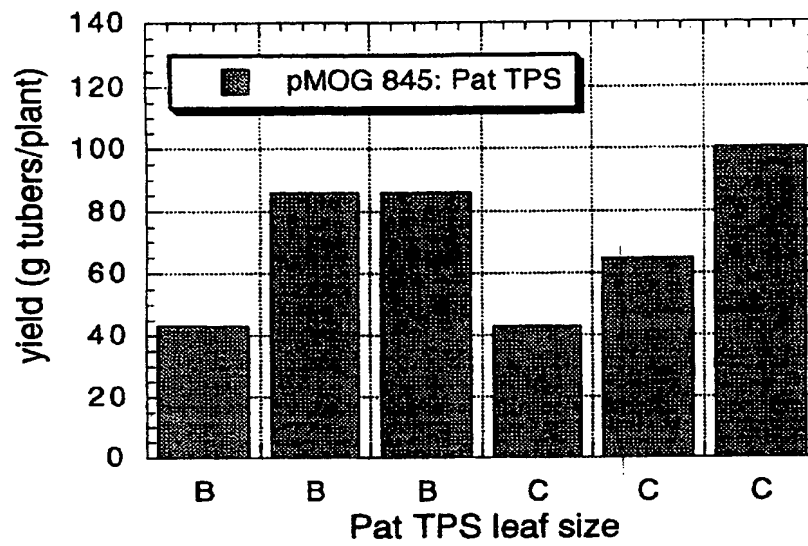
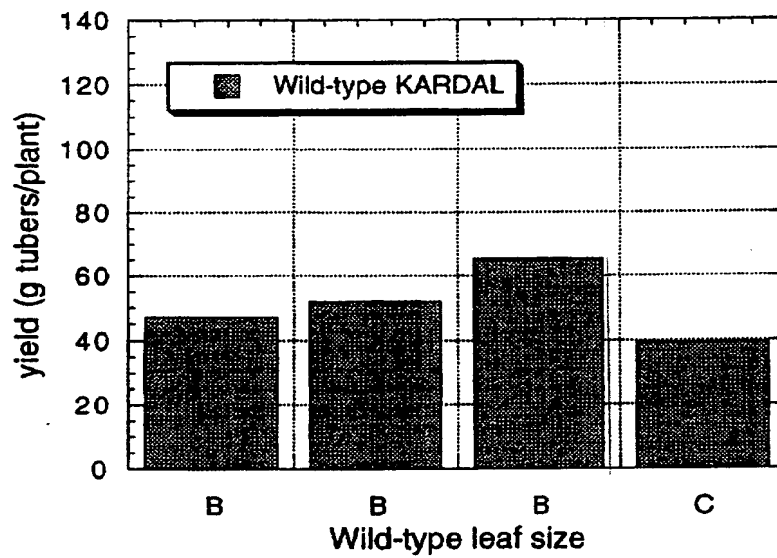


Fig. 26

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**Potato****Potato****Fig. 27**

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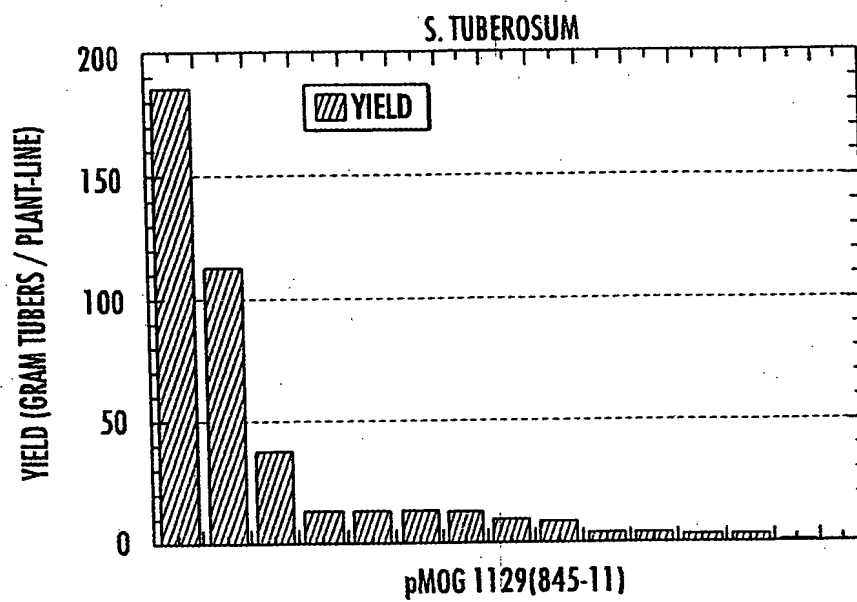


Fig. 28A

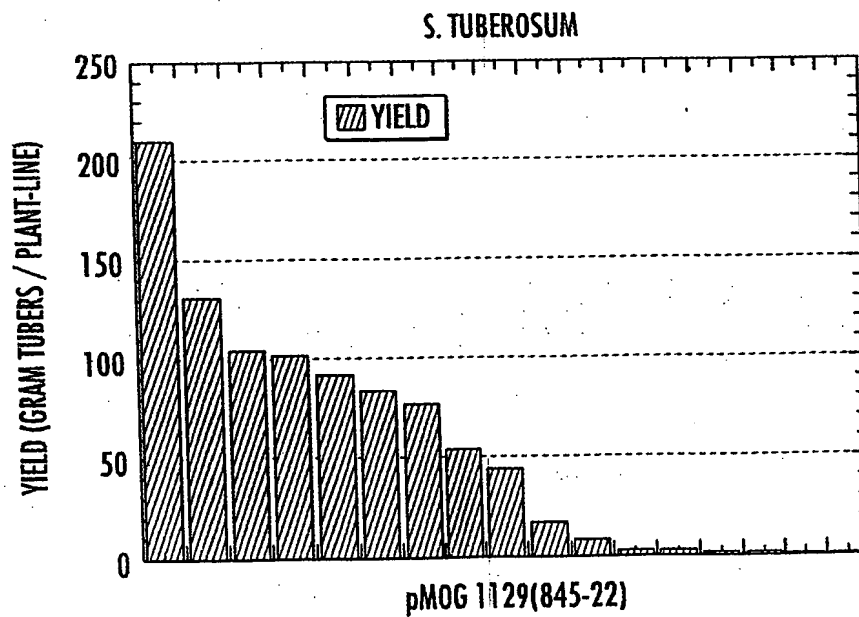


Fig. 28B

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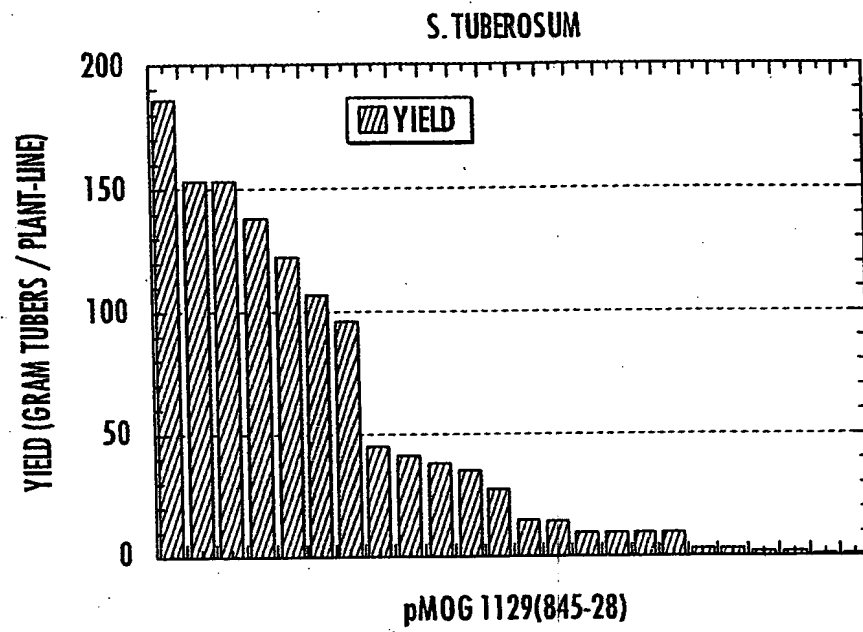
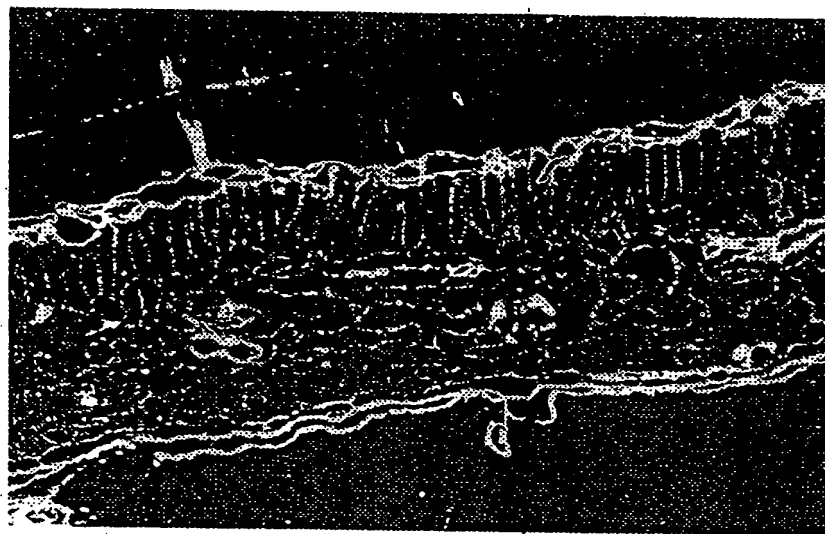


Fig. 28C

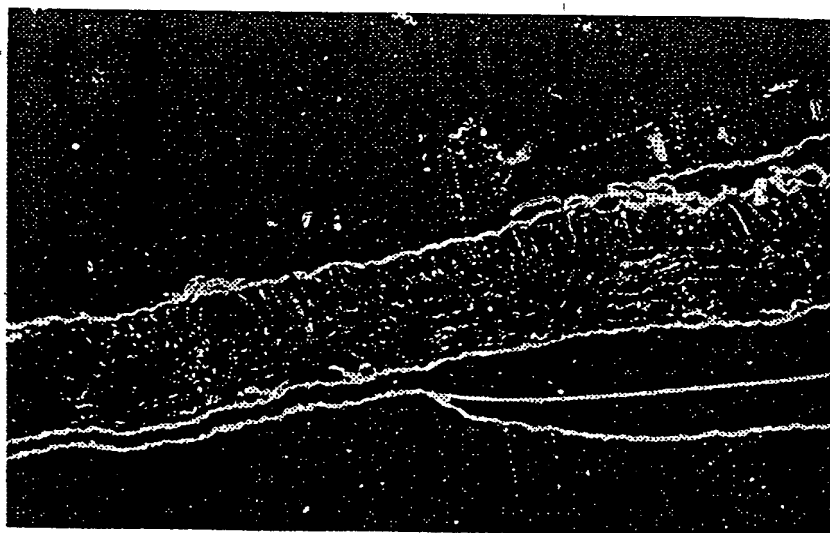
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UPPER  
EPIDERMIS  
PALLISADE  
MESOPHYLL  
SPONGY  
MESOPHYLL  
LOWER  
EPIDERMIS

TPS TRANSGENIC TOBACCO LEAF

Fig. 29A

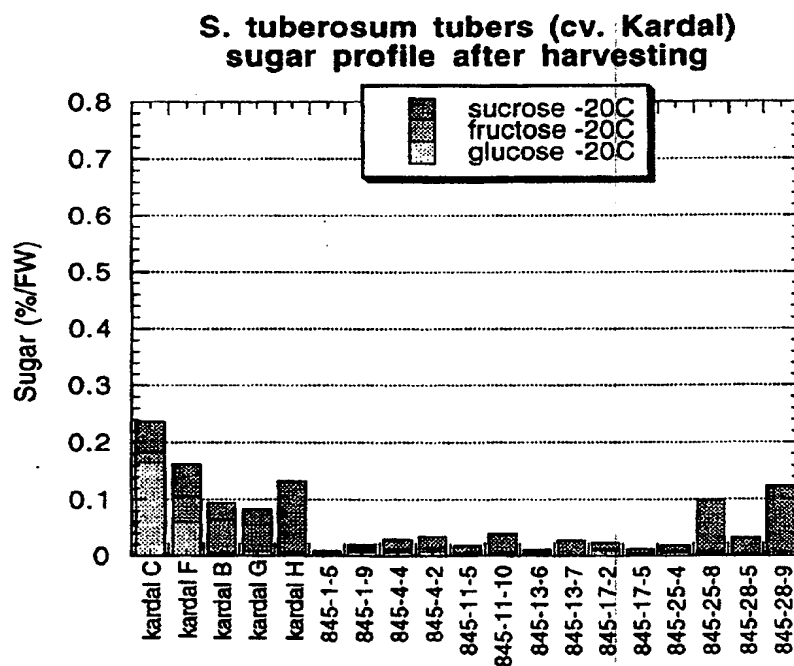
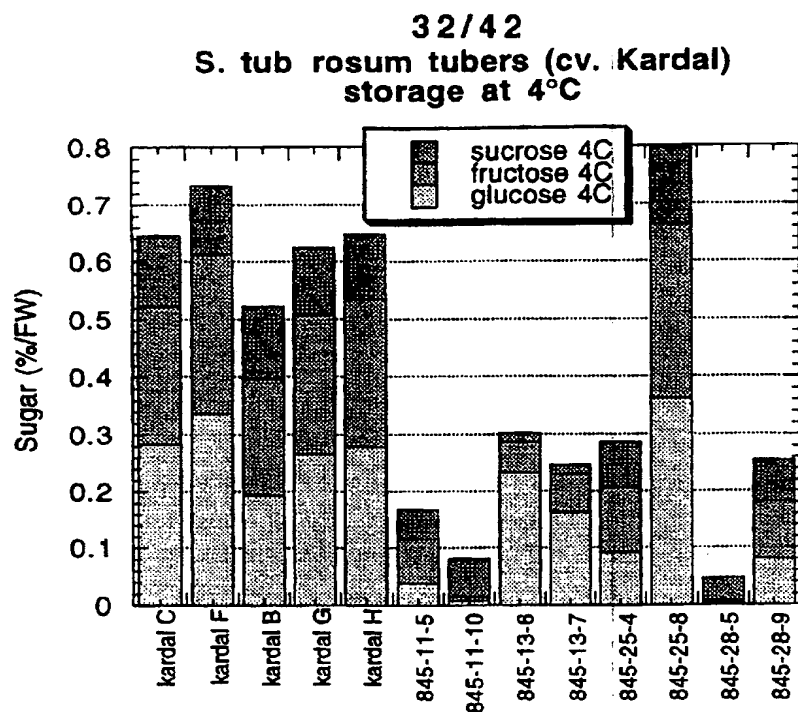


UPPER  
EPIDERMIS  
PALLISADE  
MESOPHYLL  
SPONGY  
MESOPHYLL  
LOWER  
EPIDERMIS

TPP TRANSGENIC TOBACCO LEAF

Fig. 29B



**Fig. 30**

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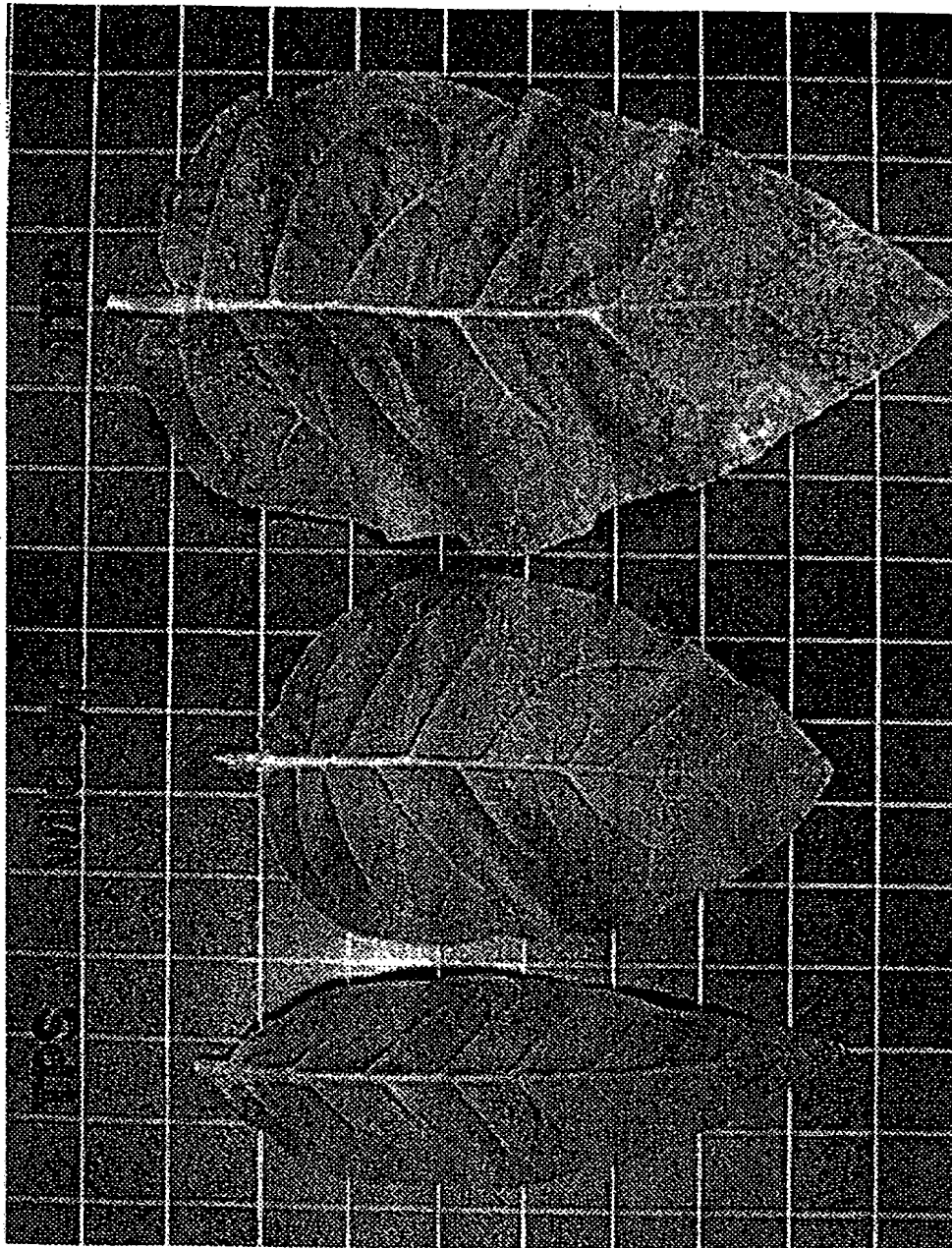


Fig. 31

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N. TABACUM

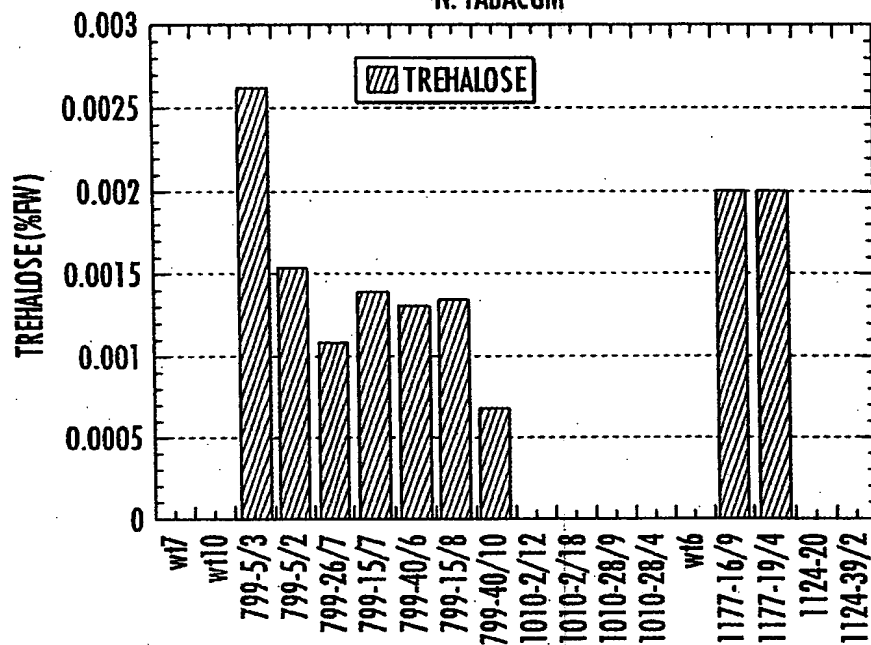


Fig. 32A

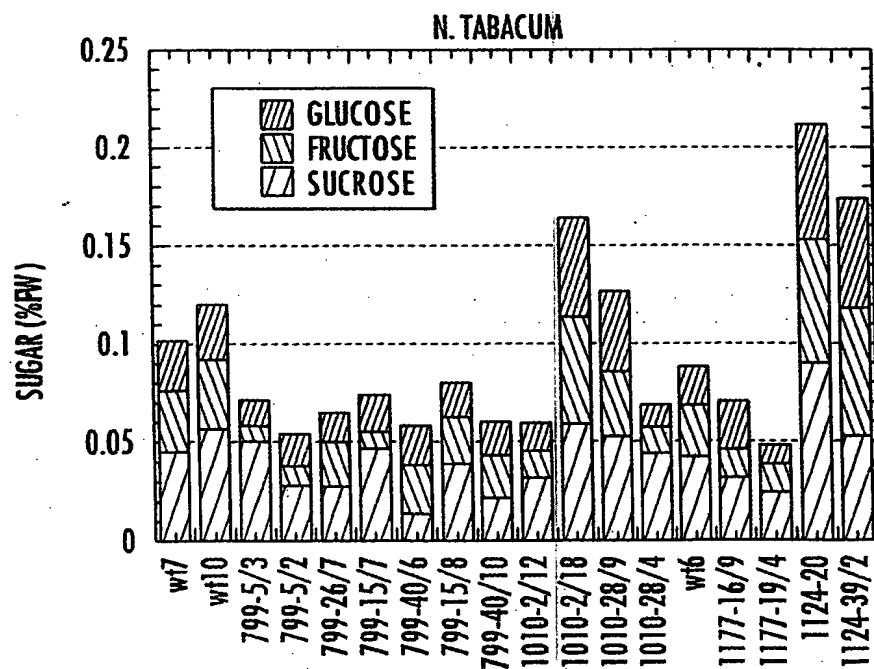


Fig. 32B

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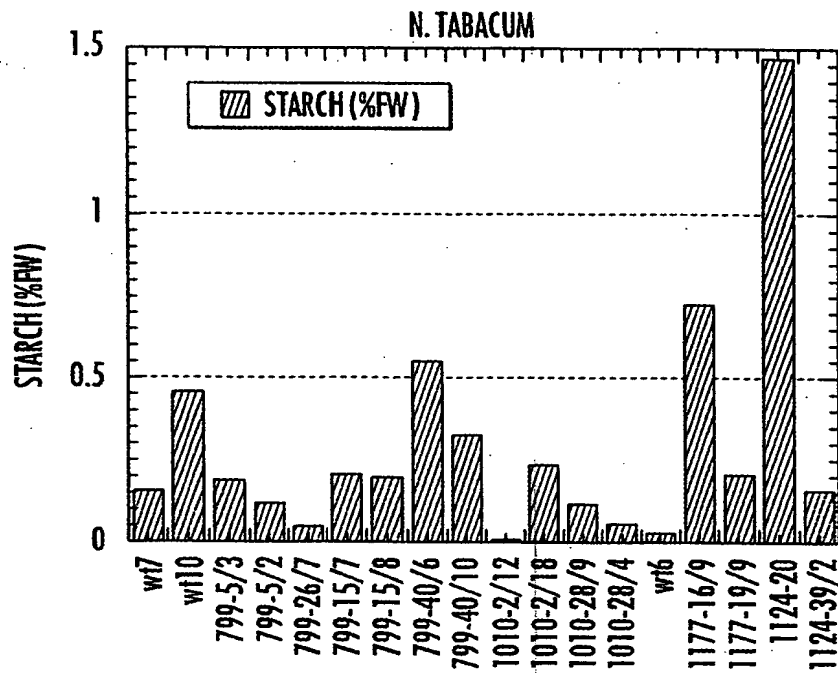


Fig. 32C

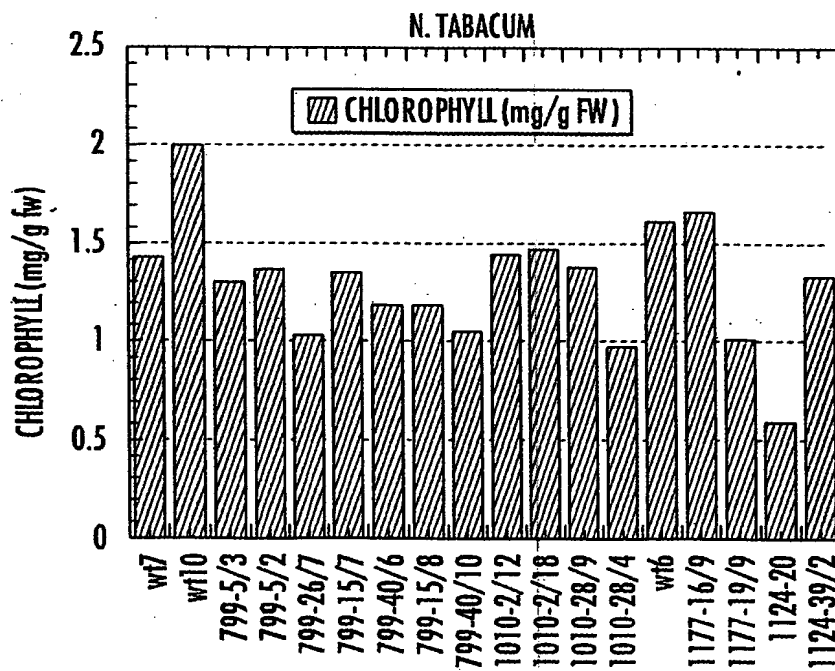


Fig. 32D

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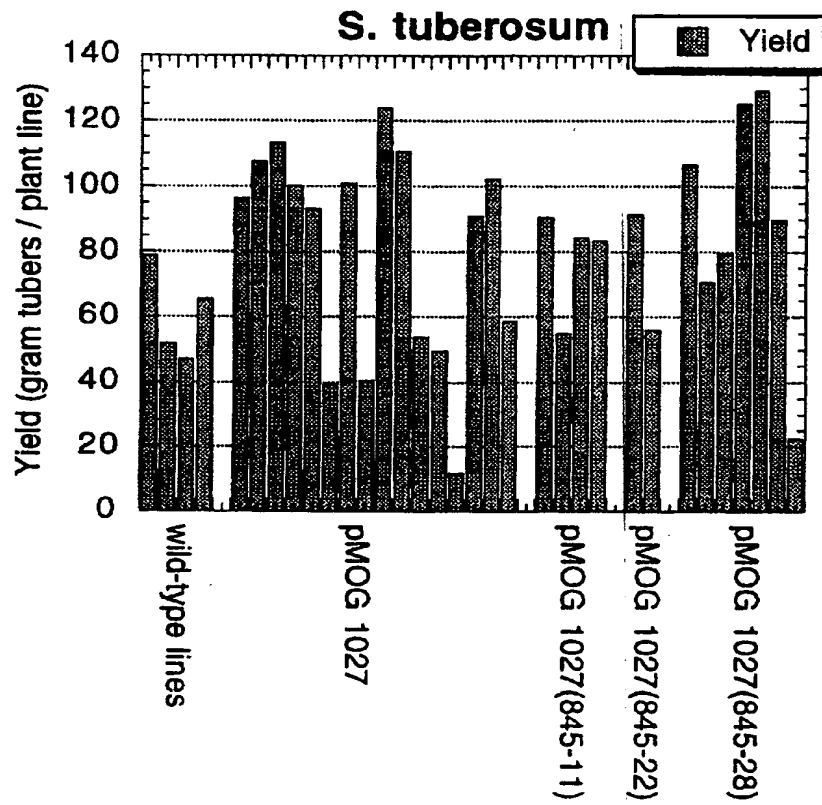


Fig. 33

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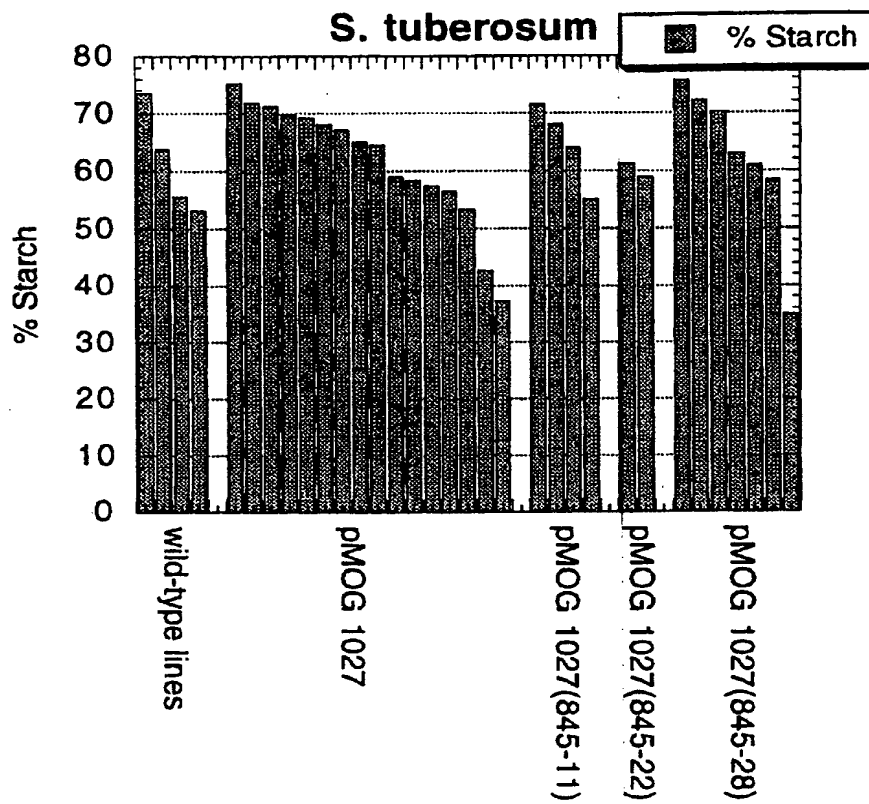


Fig. 34

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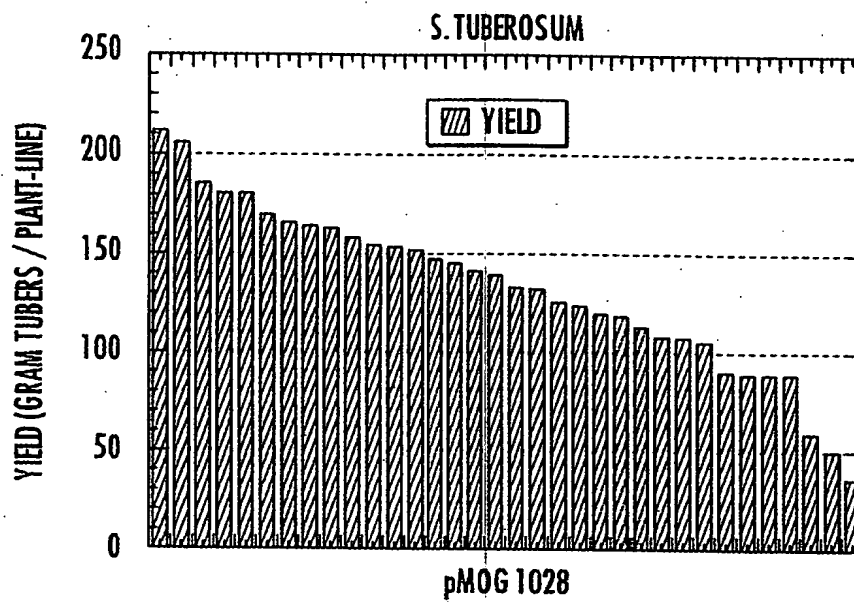


Fig. 35A

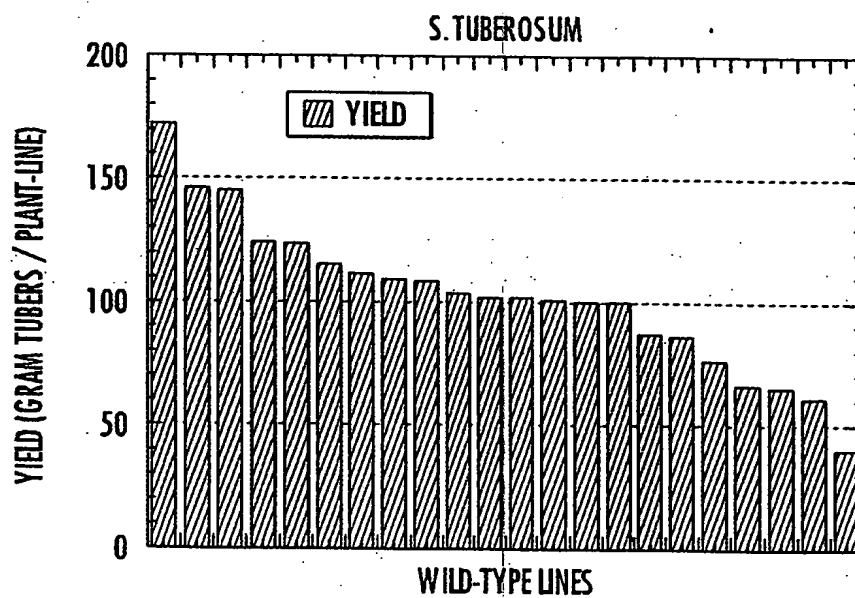


Fig. 35B

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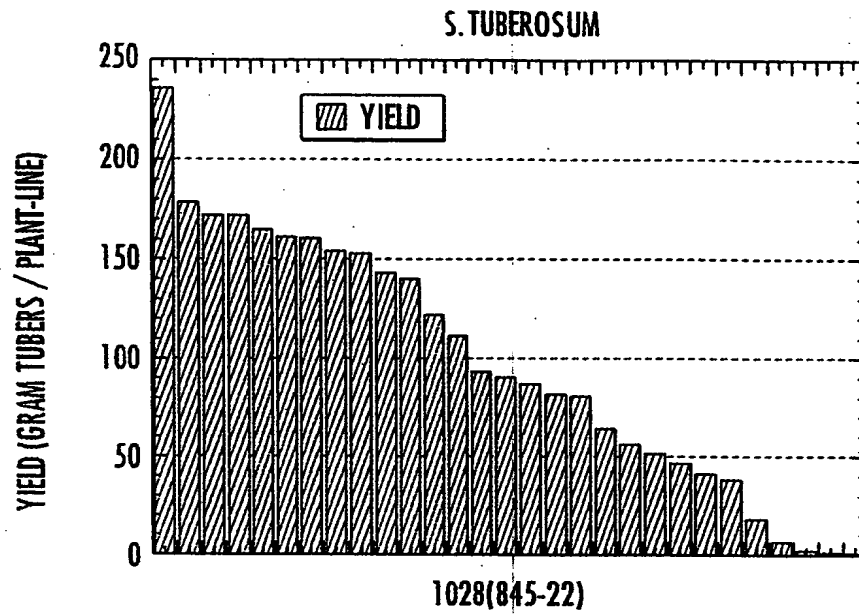


Fig. 35C

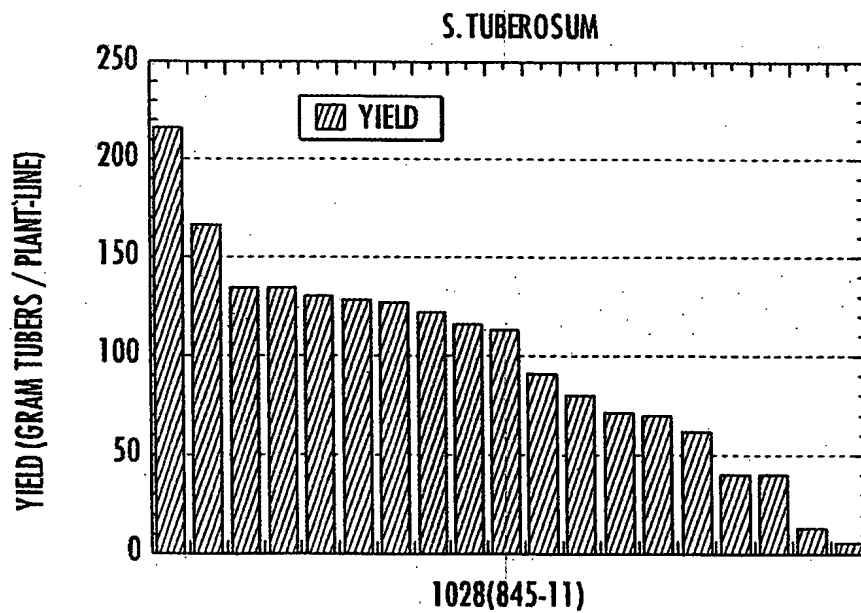
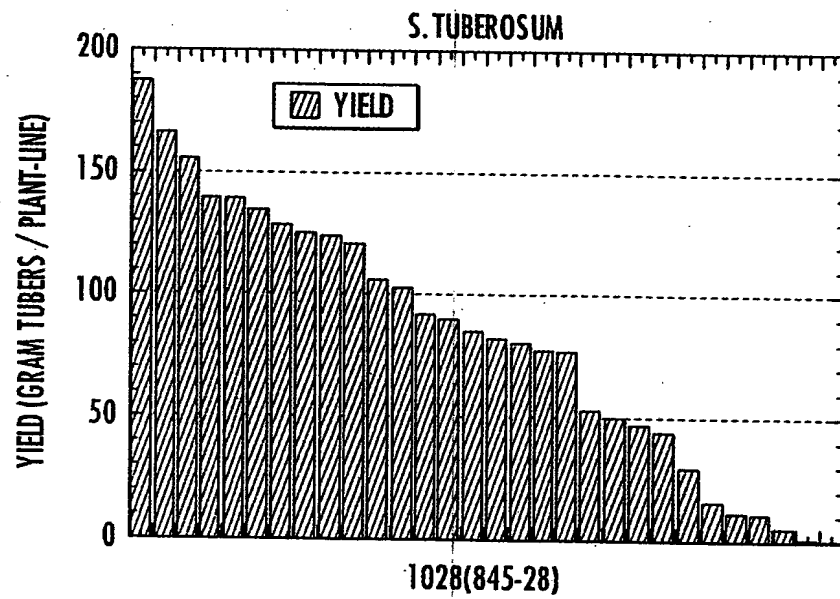


Fig. 35D



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*Fig. 35E*

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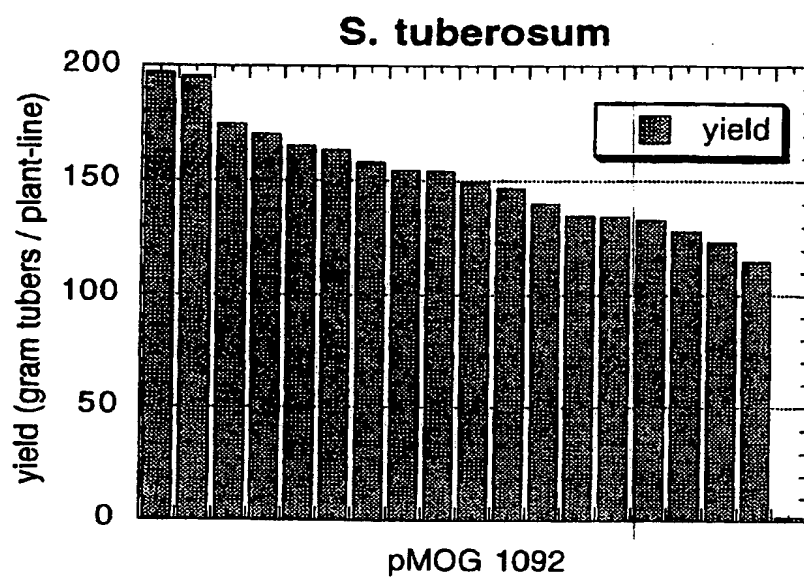


Fig. 36

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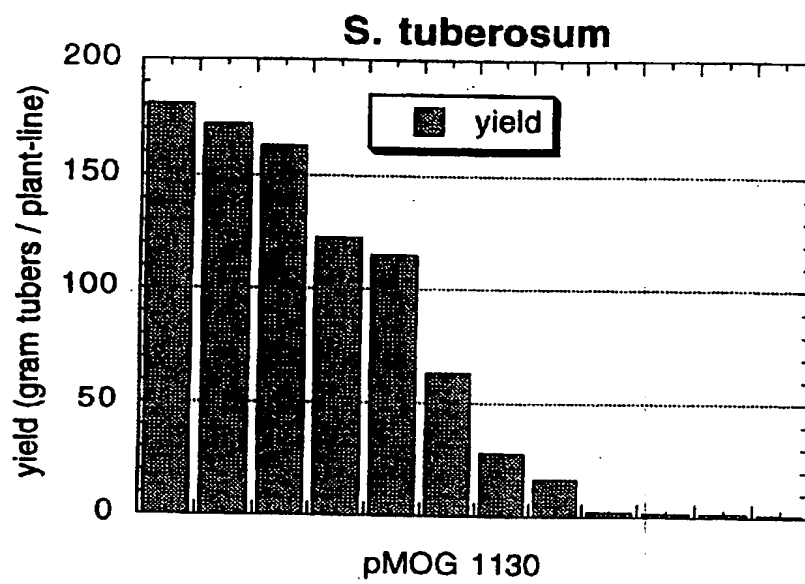


Fig. 37